APPENDIX C

Traffic Impact Analysis

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TRAFFIC IMPACT ANALYSIS
KAISER SAN DIEGO CENTRAL MEDICAL CENTER

San Diego, California
May 17th, 2013

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TRAFFIC IMPACT ANALYSIS

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

San Diego, California

May 17th, 2013

1.0 EXECUTIVE SUMMARY

1.1 Project Description

Kaiser Foundation Hospitals (Kaiser) is proposing the Kaiser Permanente San Diego Central Medical Center Project to be implemented in two phases on a site located on the southeast corner of the Clairemont Mesa Boulevard / Ruffin Road intersection in the City of San Diego. As summarized in ***Table 1-1*** below, Phase I (Year 2017) consists of a seven-story, 321 bed Kaiser Permanente general acute and tertiary care hospital (the "Hospital"), a 75,000 SF Medical Office Building (MOB), a surface parking lot with 100 parking spaces adjacent to the Emergency Department (ED) and a parking structure with 1,359 parking spaces for a total of 1,459 parking spaces.

Phase II (Year 2035) will add 129 beds to the hospital, 105,000 SF of MOB and expand the parking structure to provide an additional 1,134 parking spaces, for a total of 450-beds, 180,000 SF of MOB space and 2,593 parking spaces. The total building area for the entire hospital, MOB and ancillary uses is 938,981 SF. The project proposes to provide one surface parking lot with 100 spaces at the northwest corner of the site and a parking structure with 2,493 spaces at the southeast corner of the site, for a total of 2,593 spaces.

TABLE 1-1
PROJECT DESCRIPTION

Description	Phase I (2017)		Phase II (2030)		Total Project	
Parking	1,459	Spaces	1,134	Spaces	**2,593**	**Spaces**
Beds	321	Beds	129	Beds	**450**	**Beds**
Hospital	565,000	SF	155,000	SF		
Medical Office Building (MOB)	75,000	SF	105,000	SF		
Central Plant	39,981	SF				
Building	**678,981**	**SF**	**260,000**	**SF**	**938,981**	**SF**

1.2 Project Trip Generation

Based on City of San Diego *driveway rates*, the project is estimated to generate a total of 18,000 daily trips with 1,350 trips (999 inbound and 351 outbound) during the AM peak hour and 1,800 trips (541 inbound and 1,259 outbound) during the PM peak hour at the driveways. Based on City of San Diego *cumulative rates*, the project is estimated to generate a total of 12,600 daily trips with 1,026 trips (740 inbound and 286 outbound) during the AM peak hour and 1,260 trips (378 inbound and 882 outbound) during the PM peak hour. The site is currently occupied by the County of San Diego Operations Center, whose operations are in the process of being transferred to a new complex nearing completion west of Ruffin Road between Farnham Street and Chesapeake Drive. Applying deductions for traffic currently being generated on the site (which will be vacated) the net new cumulative trips generated by the entire project are 8,278 daily trips with 497 trips (288 inbound and 209 outbound) during the AM peak hour and 807 trips (296 inbound and 511 outbound) during the PM peak hour.

A study area including twenty-five (25) intersections, twenty-four (24) segments, seven (7) freeway mainline segments and five (5) metered freeway on-ramps were analyzed for seven (7) analysis scenarios.

1.3 Project Access

Access driveways are proposed on all three frontage roads. A new signalized full access driveway is proposed on Clairemont Mesa Boulevard. Emergency Department access will be at a right-in / right-out only access on Ruffin Road. An access driveway with direct access to the parking structure and an access driveway for deliveries and other trucks will be provided on Ruffin Court.

TABLE 1-2
TRIP GENERATION SUMMARY

Land Use	Quantity		Daily Trip Ends (ADT)			AM Peak Hour					PM Peak Hour				
						% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume[b]		
			Rate [a]		Volume			In	Out	Total			In	Out	Total
Kaiser Permanente Hospital - Phase I															
Hospital	321	Beds	20	/Bed	6,420	9%	70:30	405	173	578	10%	30:70	193	449	642
Medical Offices															
Driveway Trips	75	KSF	50	/KSF	3,750	6%	80:20	180	45	225	10%	30:70	113	262	375
Cumulative Trips	75	KSF	20	/KSF [c]	1,500	6%	80:20	72	18	90	10%	30:70	45	105	150
Project Phase I															
Driveway Trips					**10,170**			**585**	**218**	**803**			**306**	**711**	**1,017**
Cumulative Trips (New Trips)					**7,920**			**477**	**191**	**668**			**238**	**554**	**792**
(Less) Existing Site Trip Generation (June '11)					(4,332)			(452)	(77)	(529)			(82)	(371)	(453)
Net Trips (Cumulative Rates) - Project Phase I					**3,588**			**25**	**114**	**139**			**156**	**183**	**339**
Kaiser Permanente Hospital - Phase II															
Hospital	129	Beds	20	/Bed	2,580	9%	70:30	162	70	232	10%	30:70	77	181	258
Medical Offices															
Driveway Trips	105	KSF	50	/KSF	5,250	6%	80:20	252	63	315	10%	30:70	158	367	525
Cumulative Trips	105	KSF	20	/KSF [c]	2,100	6%	80:20	101	25	126	10%	30:70	63	147	210
Phase II															
Driveway Trips					**7,830**			**414**	**133**	**547**			**235**	**548**	**783**
Cumulative Trips (New Trips)					**4,680**			**263**	**95**	**358**			**140**	**328**	**468**
Entire Project															
Driveway Trips					**18,000**			**999**	**351**	**1,350**			**541**	**1,259**	**1,800**
Cumulative Trips (New Trips)					**12,600**			**740**	**286**	**1,026**			**378**	**882**	**1,260**
(Less) Existing Site Trip Generation (June '11)					(4,332)			(452)	(77)	(529)			(82)	(371)	(453)
Net Trips (Cumulative Rates) - Entire Project					**8,268**			**288**	**209**	**497**			**296**	**511**	**807**

Footnotes:

a. Trip rates from *Trip Generation Manual*, City of San Diego, May 2003.
b. KSF - 1,000 Square Feet.
c. Daily cumulative trip rate is 20 per KSF for Medical Office Building (MOB).

1.4 Parking

A parking structure and a surface parking lot will provide patient, visitor and employee parking. Approximately 60% more than the minimum vehicular parking required per the City's Land Development Code is proposed. The minimum parking required and the proposed parking are summarized below.

TABLE 1-3
PARKING SUMMARY

Description	City of San Diego Rates [a]	Phase I (2017)		Phase 2 (2030)		Total Parking Spaces
		Size	Spaces	Size	Spaces	
Minimum Parking Required						
Hospital						
Vehicle	2 spaces per bed	321 Beds	642	129 Beds	258	**900**
Accessible	2 % of Auto Minimum	642 Spaces	13	258 Spaces	5	**18**
Bicycle	2 % of Auto Minimum	642 Spaces	13	258 Spaces	5	**18**
Motorcycle	2 % of Auto Minimum	642 Spaces	13	258 Spaces	5	**18**
Medical Office Building						
Vehicle	4 spaces per KSF [b]	75 KSF	300	105 KSF [b]	420	**720**
Accessible	2 % of Auto Minimum [c]	300 Spaces	6	420 Spaces	8	**14**
Bicycle	3 % of Auto Minimum	300 Spaces	9	420 Spaces	13	**22**
Motorcycle [b]	2 % of Auto Minimum	300 Spaces	6	420 Spaces	8	**14**
Total Minimum Parking Required						
Vehicle			**942**		**678**	**1,620**
Accessible			**19**		**13**	**32**
Bicycle			**22**		**18**	**40**
Motorcycle			**19**		**13**	**32**
Parking Proposed						
Vehicle			**1,459**		**1,134**	**2,593**
Accessible			**60**		**93**	**153**
Bicycle			**29**		**23**	**52**
Motorcycle			**29**		**23**	**52**
Excess Vehicle Parking Available			**517**		**456**	**973**

Footnotes:

a. Minimum parking requirement obtained from Table 142-05G, Chapter 14: General Regulations, *San Diego Municipal Code*.
b. KSF - 1,000 square feet.
c. 2% of required vehicular spaces, 300 spaces in Phase 1 and 420 spaces in Phase 2 (see required minimum spaces for Medical Office Building.

1.5 Impacts and Mitigation Measures

The direct and cumulative project significant impacts and the recommended mitigation measures are described below.

Direct Impacts:

Existing + Project Phase 1:

No direct impacts were calculated in this analysis timeframe. Therefore, no mitigation measures are required prior to the development and operation of Project Phase 1.

Existing + Entire Project:

No direct impacts were calculated in this analysis timeframe. Therefore, no mitigation measures are required prior to the development and operation of the Entire Project.

Near-Term + Project Phase 1:

No direct impacts were calculated in this analysis timeframe. Therefore, no mitigation measures are required prior to the development and operation of Project Phase 1.

Near-Term + Entire Project:

The following improvements are required to mitigate the near-term direct impacts determined in this analysis timeframe. These mitigation measures should be implemented prior to the development and operation of Phase 2 of the Project.

Intersections

Clairemont Mesa Boulevard / Ruffin Road (100% Contribution)
This impact is considered significant and unmitigated as explained in Section 14.2.1.

Balboa Avenue / Ruffin Road (100% Contribution)
Provide SB to WB right-turn overlap phasing at the Balboa Avenue / Ruffin Road intersection. (EB to WB U-turns are currently not permitted and therefore, providing SB right-turn overlap phasing will not impact any U-turning traffic).

Segments

None

Freeway Segments

None

Ramp Meters

None

Cumulative Impacts

Year 2035 + Entire Project:

The following improvements are recommended to mitigate the long-term cumulative impacts determined in this analysis timeframe.

Intersections

Clairemont Mesa Boulevard / Murphy Canyon Road (100% Contribution)
The third EB through lane on Clairemont Mesa Boulevard between Ruffin Road and Murphy Canyon Road that the project will provide prior to opening day will become a shared through / right-turn lane at Murphy Canyon Road, thereby providing additional capacity at the intersection.

Balboa Avenue / Viewridge Avenue (100% Contribution)
Restripe the southbound approach of the Balboa Avenue / Viewridge Avenue intersection to provide a second southbound left-turn lane and provide suitable signal modification to accommodate the second southbound left-turn lane.

Freeway Segments

I-15: Clairemont Mesa Boulevard to Balboa Avenue
The project should contribute an 8% fair share towards future improvements on I-15. Since there are no programmed improvement plans for this segment of I-15, the impact is considered not fully mitigated.

I-15: Balboa Avenue to Aero Drive
The project should contribute a 10% fair share towards future improvements on I-15. Since there are no programmed improvement plans for this segment of I-15, the impact is considered not fully mitigated.

Ramp Meters

Clairemont Mesa Blvd to SB I-15 Metered Freeway On-Ramp
The Clairemont Mesa Boulevard to SB I-15 on-Ramp currently has one HOV lane and 2 SOV lanes and is built to its ultimate configuration, therefore, no feasible mitigation is available and the impact is not mitigated.

With implementation of the above recommended mitigation measures, the significant direct and cumulative impacts are considered fully mitigated, except for the significant cumulative impacts on I-15 Freeway segments and the metered Ramp at the Clairemont Mesa Boulevard / I-15 SB On-Ramp.

1.6 Other Improvements

In addition to the above, the project will provide the following frontage improvements and on-site circulation:

- **Clairemont Mesa Boulevard: Ruffin Road to Murphy Canyon Road -** The project will dedicate appropriate right-of-way along its entire frontage on Clairemont Mesa Boulevard including appropriate off-site transitions and construct a third EB through lane between Ruffin Road and Murphy Canyon Road (see conceptual drawing M-1 in *Appendix M*).
- **Clairemont Mesa Boulevard / Project Driveway -** The Project will install a traffic signal at this new intersection and provide interconnect to the existing coordinated signal system on Clairemont Mesa Boulevard. The Project will provide the following lane configuration (see conceptual drawing M-1 in *Appendix M*),

  - **WB:** Two 300-foot long left-turn lanes and three through lanes
  - **NB:** Two right-turn lanes and one left-turn lane
  - **EB:** One 150-foot long right-turn lane, three through lanes and a Class II bike lane

- **Ruffin Road: North of Ruffin Court -** The Project will install a 280 foot long raised median in the southern portion of Ruffin Road, between Clairemont Mesa Boulevard and Ruffin Court where a median does not currently exist (see Figure M-4 in *Appendix M*).
- **On-Site Circulation -** SB traffic will not be stopped at the first internal intersection of the roadway from the Clairemont Mesa Boulevard signalized access point.
- **Bus Stop -** The project will relocate the existing bus stop for EB routes #25 and #928 on Clairemont Mesa Boulevard (currently located just west of Ruffin Road on the south side of Clairemont Mesa Boulevard) to the east side on Ruffin Road, along the project frontage.

2.0 INTRODUCTION

Kaiser Permanente (Kaiser) is proposing to construct a Hospital and Hospital Support Building (HSB) at the existing County Operations Center (Annex) site in Kearny Mesa. The site is located at the southeast corner of the Clairemont Mesa Boulevard / Ruffin Road intersection. It is proposed to provide access via Clairemont Mesa Boulevard, Ruffin Road and Ruffin Court. The purpose of this report is to determine traffic impacts due to the project on the surrounding street network under various analysis scenarios.

This report includes the following:

1.0 Executive Summary
2.0 Introduction
3.0 Proposed Project
4.0 Analysis Approach and Methodology
5.0 Existing Conditions
6.0 Significance Criteria
7.0 Cumulative Projects
8.0 Analysis of Existing Plus Project Traffic (Opening Day Year 2017)
9.0 Analysis of Near-Term Scenarios
10.0 Analysis of Long-Term Scenarios (Horizon Year 2035)
11.0 Access, Parking and On-Site Circulation Evaluation
12.0 Transit and Other Modes
13.0 Transportation Demand Management
14.0 Significance of Impacts and Mitigation Measures

Figure 2-1 is the Vicinity Map and ***Figure 2-2*** depicts the project area map.

2.1 Project Description

The project area is situated in the Kearny Mesa Community Plan Area ("Kearny Mesa CP") and zoned Light-Industrial (IL-2-1) which allows for the construction and operation of a hospital with a Conditional Use Permit ("CUP"). The Project will require a CUP to allow for hospital use within the Light–Industrial IL-2-1 zone and a Planned Development Permit to exceed the maximum 0.50 Floor Area Ratio allowed within the Kearny Mesa Community Plan. Kaiser Foundation Hospitals (Kaiser), a California nonprofit public benefit corporation is proposing a medical center project to be located on an approximately 20 acre site in the City of San Diego to be known as the Kaiser Permanente San Diego Central Medical Center Project (the "KP Central Medical Center Project"). The project will also require a Site Development Permit as the proposed retaining walls along Clairemont Mesa Boulevard will encroach into environmentally sensitive land. The KP Central Medical Center Project will be implemented in two phases. Phase I will commence with the construction of a hospital, a Hospital Support Building (HSB), and a central utility plant and is scheduled to open between 2017 and 2019. Phase 1 will consist of a seven-story, 321 bed, 565,000

SF Kaiser Permanente general acute and tertiary care hospital (the "Hospital"), a 75,000 SF outpatient HSB, a 39,981 SF central utility plant (the "Energy Center"), an outdoor service yard including loading docks, SDG&E yard and the Tech docks, adjacent to the Central Utility Plant, is proposed, and a 1,359 stall parking structure and a 100 space surface lot for a total of 1,459 parking spaces. Phase II will consist of Buildout of the KP Central Medical Center Project and is planned to include the potential expansion of the hospital and/or the construction of new medical offices or other uses after the initial complement of construction is completed ("Buildout"). Buildout could include expansion of the KP Central Medical Center by an additional 260,000 SF, including a 155,000 SF, 7-story, 129-bed expansion of the hospital, the construction of a new 105,000 SF HSB and surface and expansion of the parking structure totaling 2,493 spaces for a total of 2,593 parking spaces. Buildout is expected to commence between 2025 and 2030 and will be completed between 2030 and 2035.

2.2 Project Location

The site is southeast of the US Marine Corps Air Station and northeast of Montgomery Airfield. The site is immediately adjacent to the County owned Polinsky Child Services Center (to the east of the site) and is surrounded by a mix of light industrial, warehouse and other commercial uses. The site has a City of San Diego General Plan designation of 'Institutional', a zoning designation of Light Industrial (IL-2-1) and is within the Kearny Mesa Community Plan Area.

Along the northern frontage of the site Clairemont Mesa Boulevard drops in elevation from west to east below the pad at the northwest corner and continues to drop eastwards. This sloping roadway course presents challenges for providing efficient ingress-egress access from the site to/from Clairemont Mesa Boulevard. However, the project design incorporates a new signalized intersection as well as public right-of-way improvements including widening and other measures to accommodate the project traffic and mitigate surrounding impacts. An existing right-in / right-out access on Clairemont Mesa Boulevard and a right-out only access on Ruffin Road are planned to be closed. The existing and planned access driveways are discussed in greater detail later in this section.

The Hospital will be a full-service general acute care hospital. In addition to the inpatient nursing functions, the hospital will also house ancillary services, including medical imaging/radiology, clinical laboratory & blood bank, operating rooms and associated recovery spaces, inpatient pharmacies, and an emergency department which will have associated treatment rooms. The hospital will also house some administrative offices and conference rooms, as well as general building support departments such as environmental and material services, cafeteria and inpatient food services, communication, linen, and biomedical engineering.

Emergency Storage will be located off of the entrance to the Emergency Department (ED) at Ruffin Road. This is a dedicated storage for disaster preparedness supplies. Access is limited to replacing expired supplies or during a major catastrophic event. The Master Sign Plan will include signs limiting both points of access as "Employee Access Only." No day-to-day traffic is anticipated.

The Medical Office Building (MOB) would be immediately adjacent to and connected to the hospital. It would provide outpatient clinical departments, physician offices, exam and treatment rooms, imaging/radiology, pharmacies, additional administrative offices. The project would also provide member services departments including the business office, health education, and conference rooms.

The Energy Center would serve both the hospital and MOB, and contain all of the major mechanical and electrical equipment for the KP Central Medical Center, including boilers, chillers, emergency generators, switchgear, and telecommunications equipment. The Energy Center would also contain the offices and shops for the facilities services (engineering) department. The Energy Center would be operational with the initial opening of the project.

South of the Energy Center, a San Diego Electric and Gas (SDG&E) yard would be constructed. The yard would be approximately 39 feet by 41 feet (or 1,600 square feet) and would be a fully enclosed exterior structure with a wall height of approximately 18 feet.

The proposed project would also include frontage improvements to the roadways adjacent to the project site. These improvements are described below.

- Widen EB Clairemont Mesa Boulevard to three lanes with a Class II bike lane between Ruffin Road and Murphy Canyon Road.
- Provide a warranted signalized access at the eastern boundary of the project site on Clairemont Mesa Boulevard, approximately 760 feet (centerline-to-centerline) east of Ruffin Road.
    - Provide dual WB left-turn lanes on Clairemont Mesa Boulevard into the project site.
    - Provide an exclusive EB right-turn lane on Clairemont Mesa Boulevard into the project site.
    - Provide three (one left-turn and two right-turn) outbound lanes and two inbound lanes at the signalized project driveway.

Construction of the Kaiser Medical Center is anticipated to commence in Spring 2014, with Phase I to be completed between fall 2017 and Spring 2018. Phase II is expected to be completed between 2030 and 2035. The project includes the following distinct components.

2.2.1 *Phase I (Year 2017)*

Construction would likely commence in Spring 2014, after the issuance of construction permits by the City upon the completion of entitlements. Initial site work would include the construction of additional entrances to the site with associated street and signal improvements, modifications to the current site improvements, major excavation and grading for the hospital site, and completion of the site improvements to meet the requirements of the City of San Diego, Office of Statewide Health Planning and Delivery and Caltrans. This work would take place throughout the duration of construction activities. Licensing and move-in at the hospital is expected to occur between June 1, 2017 and December 31, 2018.

In Phase I, the project is estimated to generate 10,170 daily driveway trips, with 803 trips (585 inbound and 218 outbound) during the AM peak hour and 1,017 trips (306 inbound and 711 outbound) during the PM peak hour. The project is calculated to generate 7,920 daily cumulative trips, with 668 trips (477 inbound and 191 outbound) during the AM peak hour and 792 trips (238 inbound and 554 outbound) during the PM peak hour. The project site is currently occupied by the County Annex Office and generates approximately 4,332 daily trips. The net number of trips generated in Phase I of this project is explained in further detail in Section 7.0 Trip Generation, Distribution and Assignment.

2.2.2 *Build-out*

Future development capacity for additional integrated nursing wings, additional diagnostic and treatment space, medical specialty buildings, etc., would be included Buildout of the KP Central Medical Center Project. Future development capacity would allow Kaiser to address incorporation of new technologies in the area of health care delivery, medical treatments, energy conservation, waste handling and other yet unknown or unplanned techniques and would be implemented as feasible and appropriate.

The precise timing, order and rate of development would be at Kaiser's discretion (but consistent with the Project's approvals) and these decisions may depend upon factors not within the control of Kaiser, such as changes in health care delivery requirements, member needs, market orientation and demand, interest rates, competition and other similar factors. The outpatient medical services buildings and inpatient hospital would be sized, designed and constructed to meet the health care delivery requirements of Kaiser Permanente and may be smaller than the buildings described in this Project Description, and may be a mix of the uses contemplated for build-out.

Figure 2-3 depicts the proposed Phase I of development, while ***Figure 2-4*** depicts the buildout of the project. ***Figure 2-5*** depicts the cross-sections of Clairemont Mesa Boulevard, Ruffin Road and Ruffin Court, adjacent to the project site.

The Entire Project is estimated to generate 18,000 daily driveway trips, with 1,350 trips (999 inbound and 351 outbound) during the AM peak hour and 1,800 trips (541 inbound and 1,259 outbound) during the PM peak hour. The project is calculated to generate 12,600 daily cumulative trips, with 1,026 trips (740 inbound and 286 outbound) during the AM peak hour and 1,260 trips (378 inbound and 882 outbound) during the PM peak hour. Existing and Proposed Site Access. The net number of trips generated by the Entire Project is explained in further detail in Section 7.0 Trip Generation, Distribution and Assignment.

The aerial photo in the next page depicts the existing access driveways. Following is a description of the existing and proposed access driveways.

2.2.3 *Existing Access Driveways*

CLAIREMONT MESA BOULEVARD ACCESS

Currently, one right-in / right-out only access located approximately 330 feet east of the Ruffin Road/Clairemont Mesa Road intersection is provided.

RUFFIN ROAD ACCESS

Currently, two driveways are provided on Ruffin Road. The first is a right-in / right-out only access located approximately 465 feet south of Clairemont Mesa Road on Ruffin Road. The second is a right-turn outbound only driveway approximately 130 feet north of Ruffin Court. Inbound access is restricted with a *No Entry* sign at this driveway.

RUFFIN COURT ACCESS

Currently, one driveway is provided at the eastern boundary of the site. This access is mainly used by County staff.

2.2.4 *Proposed Access Driveways*

CLAIREMONT MESA BOULEVARD ACCESS

A warranted signalized access at the eastern boundary of the project site on Clairemont Mesa Boulevard, approximately 760 feet (centerline-to-centerline) east of Ruffin Road.

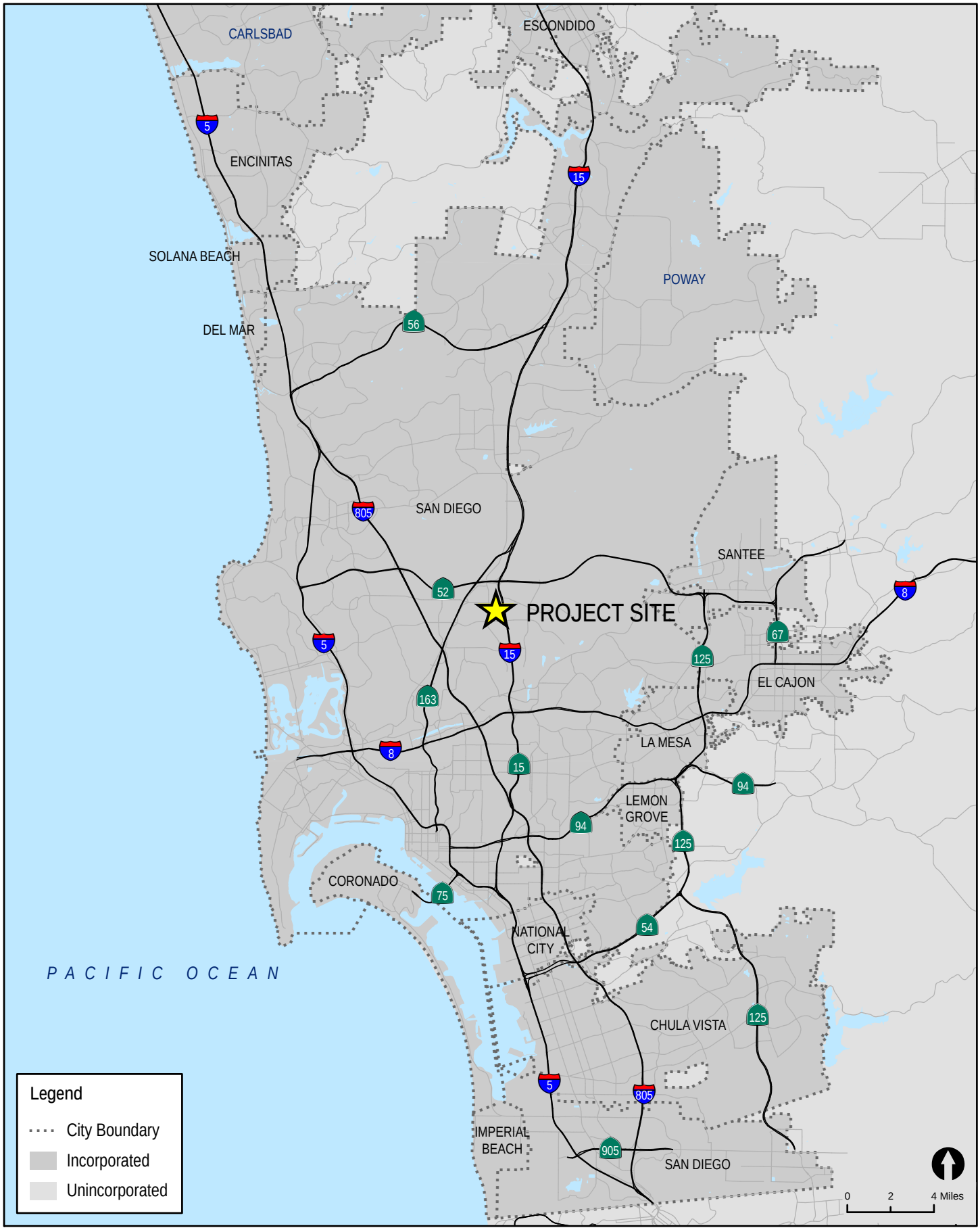
RUFFIN ROAD ACCESS

A right-in / right-out only driveway is proposed approximately 540 feet south of Clairemont Mesa Boulevard. This driveway will serve as a secondary access to the Emergency Department (ED).

RUFFIN COURT ACCESS

It is proposed to maintain the existing full access driveway at the eastern boundary of the site and provide a second driveway with direct access to the parking structure, at the southwestern corner of the parking structure in order to continue to provide mutual access to Polinsky Center. A third access driveway providing access exclusively to the loading docks, SDG&E yard and the Tech docks, is also proposed. A sign restricting access to all vehicles except delivery and other trucks will be posted at the driveway.

The proposed project access driveways are described in further detail in *Section 13.0, Access and Other Issues,*" and are shown on the site plan, *Figure 2-4*.



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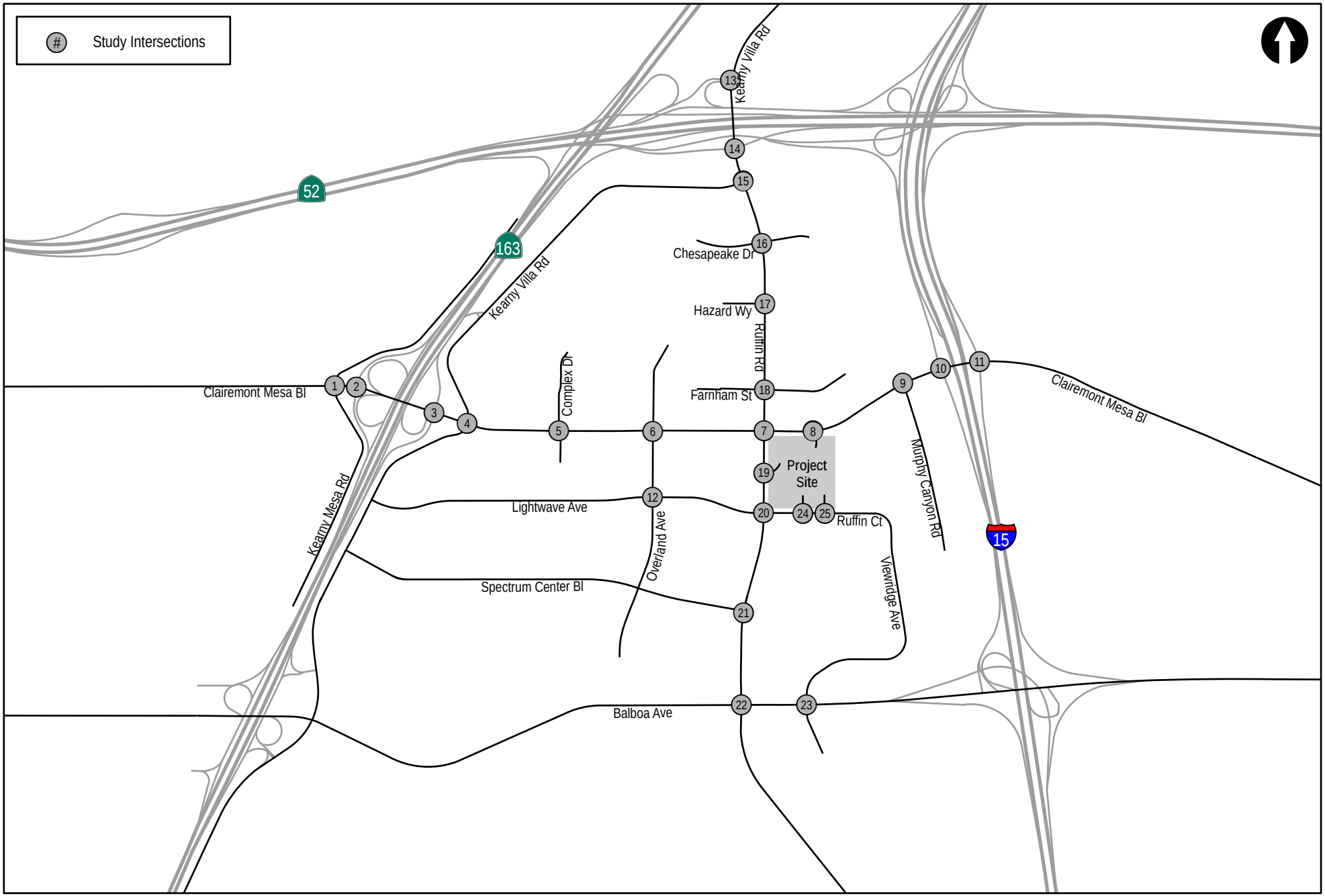
Date: 6/17/12

Figure 2-1

Vicinity Map

KAISER SAN DIEGO CENTRAL MEDICAL CENTER



LINSCOTT LAW & GREENSPAN engineers

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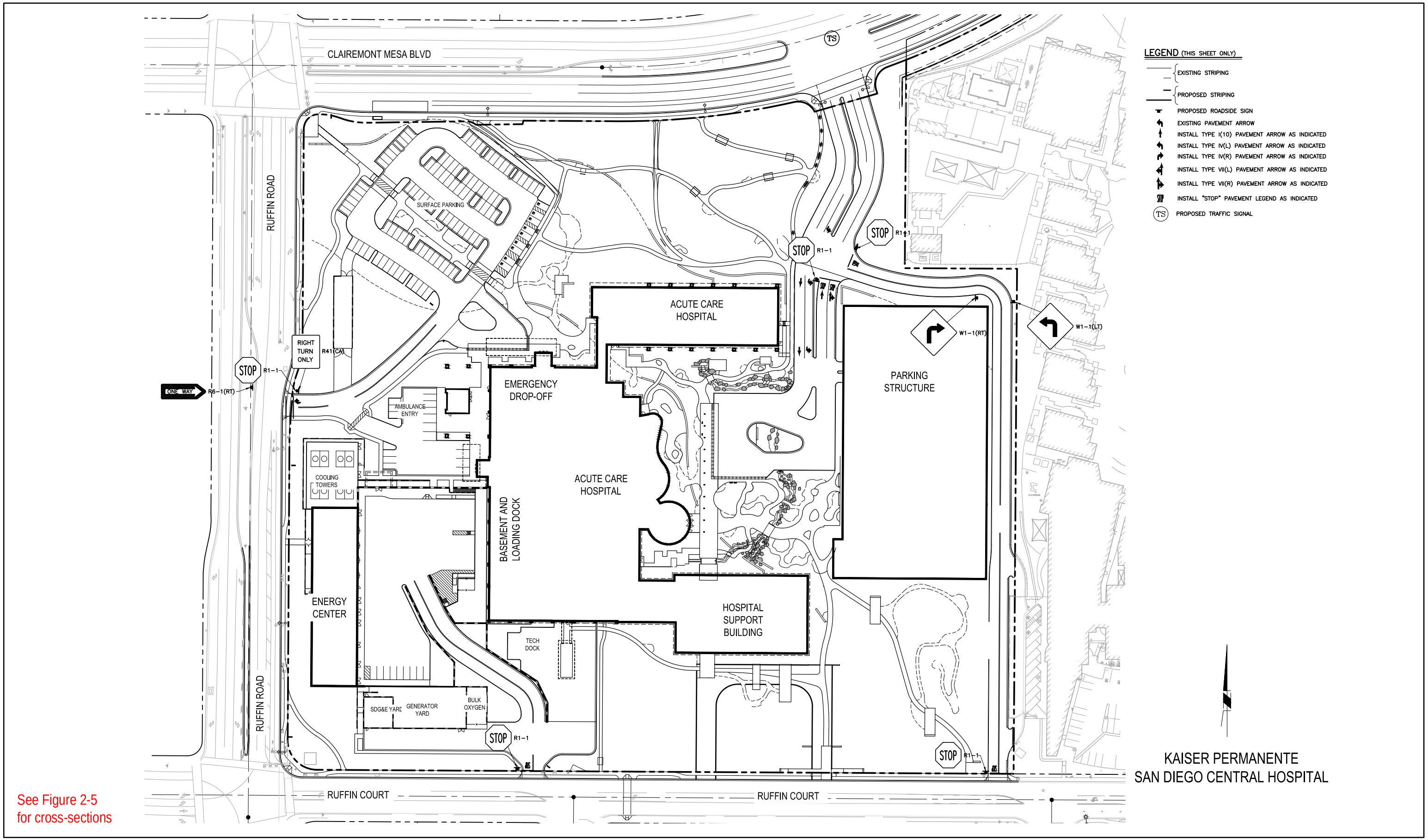
Figure 2-2

Project Area Map

KAISER SAN DIEGO CENTRAL MEDICAL CENTER



See Figure 2-5 for cross-sections

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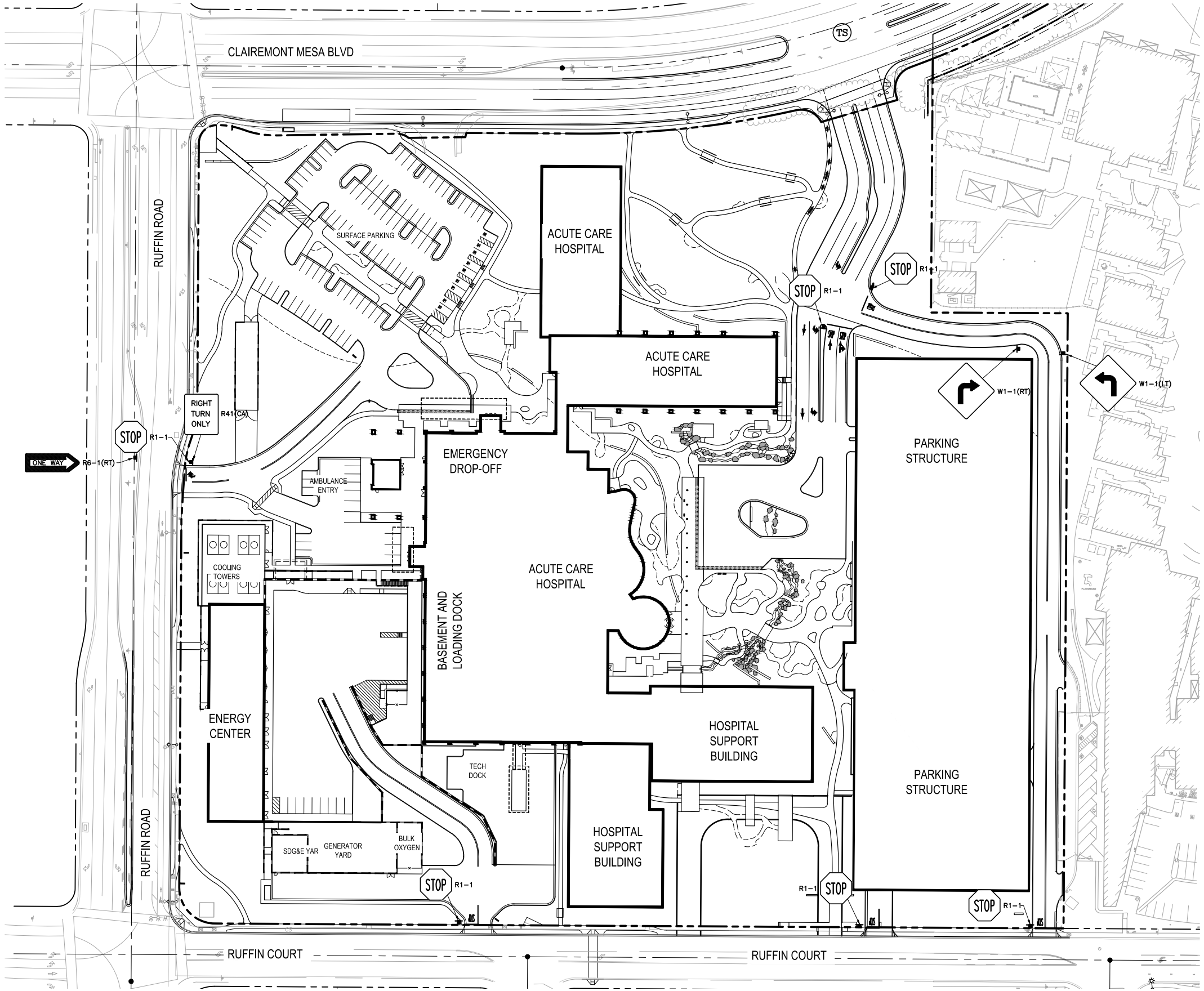
Figure 2-3

Conceptual Site Plan - Phase I

KAISER SAN DIEGO CENTRAL MEDICAL CENTER



LEGEND (THIS SHEET ONLY)

- EXISTING STRIPING
- PROPOSED STRIPING
- PROPOSED ROADSIDE SIGN
- EXISTING PAVEMENT ARROW
- INSTALL TYPE I(10) PAVEMENT ARROW AS INDICATED
- INSTALL TYPE IV(L) PAVEMENT ARROW AS INDICATED
- INSTALL TYPE IV(R) PAVEMENT ARROW AS INDICATED
- INSTALL TYPE VII(L) PAVEMENT ARROW AS INDICATED
- INSTALL TYPE VII(R) PAVEMENT ARROW AS INDICATED
- INSTALL "STOP" PAVEMENT LEGEND AS INDICATED
- TS PROPOSED TRAFFIC SIGNAL

KAISER PERMANENTE
SAN DIEGO CENTRAL HOSPITAL

See Figure 2-5
for cross-sections

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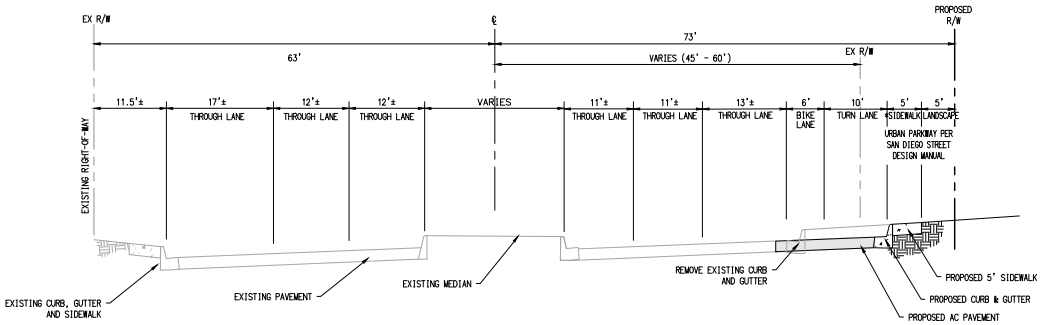
Date: 3/26/13

Figure 2-4

Conceptual Site Plan - Entire Project

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

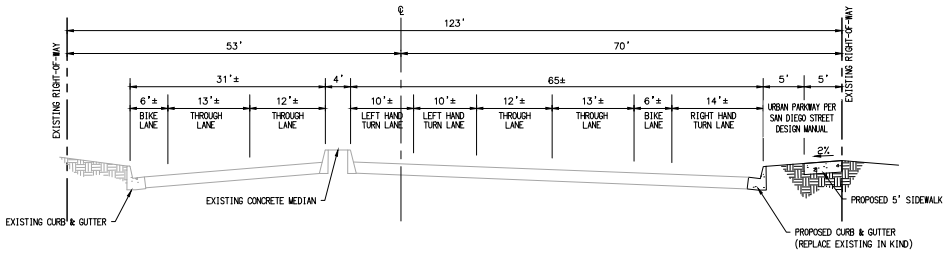


NOTES:

1. PROPOSED SIDEWALK MEANDERS TO AND FROM THE PROPOSED CURB FACE ALONG CLAIREMONT MESA BOULEVARD.
2. PARKING IS NOT CURRENTLY PERMITTED ALONG CLAIREMONT MESA BOULEVARD ALONG THE PROJECT BOUNDARY.

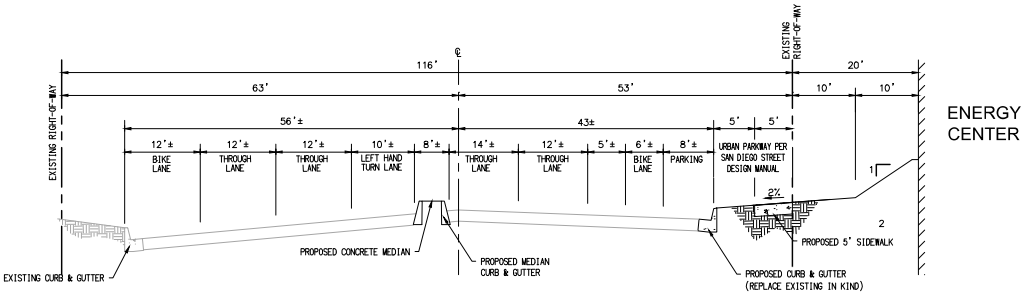
SECTION "A" - CLAIREMONT MESA BOULEVARD

HORIZONTAL SCALE: 1"=10'
STREET CLASSIFICATION: SIX LANE PRIMARY ARTERIAL



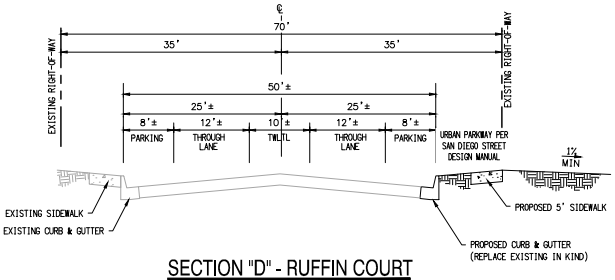
SECTION "B" - RUFFIN ROAD

HORIZONTAL SCALE: 1"=10'
STREET CLASSIFICATION: FOUR LANE MAJOR



SECTION "C" - RUFFIN ROAD

HORIZONTAL SCALE: 1"=10'
STREET CLASSIFICATION: FOUR LANE MAJOR



SECTION "D" - RUFFIN COURT

HORIZONTAL SCALE: 1"=10'
STREET CLASSIFICATION: TWO LANE COLLECTOR

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Figure 2-5

Roadway Cross-Sections

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

3.0 EXISTING CONDITIONS

Evaluation of the transportation impacts associated with the proposed *Kaiser San Diego Central Medical Center Project* requires an understanding of the existing transportation system within the project area.

3.1 Existing Street Network

The following is a brief description of the existing street system in the project area. Street classifications are based on the current *Kearny Mesa Community Plan Circulation Element*.

Figure 3–1 shows an existing conditions diagram, including signalized intersections and lane configurations and ***Figure 3-2*** depicts the existing traffic volumes.

Clairemont Mesa Boulevard is classified in the *Kearny Mesa Community Plan Circulation Element* as a Six-Lane Prime Arterial. Between SR 163 and Ruffin Road, Clairemont Mesa Boulevard is currently built as a six-Lane Prime Arterial with a raised median. Between Ruffin Road and Murphy Canyon Road, Clairemont Mesa Boulevard transitions to a five-lane divided roadway with three lanes westbound and two lanes eastbound. Clairemont Mesa Boulevard is generally surrounded by commercial / retail land uses. Curb, gutter and sidewalks are provided. Curbside parking is permitted along sections of this roadway, but not along the project frontage. The posted speed limit is 45 mph. Currently, no bike lanes are provided on this section of Clairemont Mesa Boulevard between SR 163 and I-15. A Class II Bikeway is recommended for this section of Clairemont Mesa Boulevard in the current Kearny Mesa Community Plan.

The Clairemont Mesa Boulevard intersections with Kearny Villa Road, Overland Avenue, Ruffin Road and Murphy Canyon Road are all coordinated and operated by the City of San Diego. The I-15 Ramp intersections on Clairemont Mesa Boulevard are also coordinated but separately and operated by Caltrans. There is no coordination between the City of San Diego and Caltrans operated traffic signals.

Ruffin Road is classified in the *Kearny Mesa Community Plan Circulation Element* as a Four-Lane Major Road. It is currently built as a four-lane facility with a center TWLTL. Curb, gutter, sidewalks and bike lanes are provided. Curbside parking is permitted along sections of this roadway. The posted speed limit is 45 mph. This portion of Ruffin Road is generally surrounded by commercial / retail land uses. Currently, no bike lanes are provided in the section of Ruffin Road between Chesapeake Drive and Clairemont Mesa Boulevard. Class II Bikeways are provided on Ruffin Road between Balboa Avenue and Clairemont Mesa Boulevard and on the east curb of Ruffin Road between Kearny Villa Road and Chesapeake Drive. A Class II Bikeway is recommended on Ruffin Road within the project study area, in the current Kearny Mesa Community Plan.

Ruffin Court is classified in the *Kearny Mesa Community Plan Circulation Element* and built as a Two-Lane Collector between Ruffin Road and Viewridge Court with a Two-Way-Left-Turn-Lane (TWLTL). Curb, gutter and sidewalks are provided. Curbside parking is permitted along sections of this roadway. The posted speed limit is 35 mph. Ruffin Court is generally surrounded by

commercial land uses. Currently, no bike lanes are provided on the subject section of Ruffin Court and none are recommended in the current Kearny Mesa Community Plan.

Lightwave Avenue is classified in the *Kearny Mesa Community Plan Circulation Element* as a Four-Lane Major Road with a center two-way left-turn lane and bike lanes between Kearny Villa Road and Ruffin Road and is currently built as a Four-Lane road with a Two-Way-Left-Turn (TWLTL) lane. A raised median is provided in a short section just west of Ruffin Road Curb, gutter, sidewalks and bike lanes are provided. Curbside parking is not permitted. The posted speed limit is 45 mph. Lightwave Avenue is generally surrounded by commercial including National University and the Toby Wells YMCA / residential land uses.

Balboa Avenue is classified in the *Kearny Mesa Community Plan Circulation Element* as a Six-Lane Major Road between SR 163 and Ruffin Road, and a Six-Lane Prime Arterial between Ruffin Road and I-15. Balboa Avenue is currently built as four-lane road with a raised median between SR 163 and Ruffin Road, and a Six-Lane Prime Arterial between Ruffin Road and I-15. Curb, gutter and sidewalks are provided. Curbside parking is permitted along some sections of this roadway. The posted speed limit is 45 mph. This portion of Balboa Avenue is generally surrounded by commercial land uses. Currently, a Class II Bikeway is provided in this section of Balboa Avenue as recommended in the current Kearny Mesa Community Plan.

Viewridge Avenue is classified in the *Kearny Mesa Community Plan Circulation Element* as a Two-Lane Collector between Viewridge Court and Balboa Avenue. Viewridge Avenue is currently built as Two-Lane Collector with a center Two-Way-Left-Turn-Lane (TWLTL). Curb, gutter and sidewalks are provided. Curbside parking is permitted along sections of this roadway. The posted speed limit is 35 mph. The section of Viewridge Avenue is generally surrounded by commercial land uses. Currently, no bike lanes are provided on the subject section of Viewridge Avenue and none are recommended in the current Kearny Mesa Community Plan.

State Route 163 (SR 163) is generally an Eight-Lane north / south freeway. Freeway interchanges are provided at Balboa Avenue and Clairemont Mesa Boulevard in the project study area. Additionally, freeway access ramps are also provided to NB SR 163 to / from Kearny Villa Road north and south of Balboa Avenue and an exit only ramp north of Clairemont Mesa Boulevard. Ramp Meters are also provided at the Clairemont Mesa Boulevard and Balboa Avenue on-ramps.

Interstate 15 (I-15) is generally an Eight-Lane north / south freeway. Freeway interchanges are provided at Balboa Avenue and Clairemont Mesa Boulevard in the project study area. HOV lanes are also provided on Northbound and Southbound I-15. Ramp Meters are also provided at the Clairemont Mesa Boulevard and Balboa Avenue on-ramps.

Aerial photos depicting existing conditions at the study area intersections and segments are included at the end of this section.

3.2 Existing Pedestrian Conditions

A contiguous sidewalk is currently provided in both directions on Ruffin Road along the project frontage between Clairemont Mesa Boulevard and Ruffin Court. A paved sidewalk is provided along the south curb of Clairemont Mesa Boulevard along the project frontage, between Ruffin Road and the first right-in / right out driveway. A contiguous sidewalk is currently provided on the north side of Clairemont Mesa Boulevard between Ruffin Road and Murphy Canyon Road.

It is proposed to provide a contiguous sidewalk from the signalized entrance on Clairemont Mesa Boulevard to the east along Clairemont Mesa Boulevard. A noncontiguous sidewalk will be provided along Clairemont Mesa Boulevard between the main entrance and Ruffin Road with the exception of transition, intersection and bus stop areas on Clairemont Mesa Boulevard. Both Ruffin Road and Ruffin Court will be designed primarily with noncontiguous sidewalks with transition to contiguous sidewalks at the intersections.

3.3 Transit

Several bus Routes serve the project site as described below. The San Diego Metropolitan Transit System (MTS) Routes 960 and 870 run along Clairemont Mesa Boulevard and Ruffin Road, north of Clairemont Mesa Boulevard. Bus Routes 20 and 928 run along Clairemont Mesa Boulevard and Ruffin Road, south of Clairemont Mesa Boulevard. Bus Routes 25, 27 and 120 run along Clairemont Mesa Boulevard.

The aerial photo of the project area in the previous page, shows the existing bus stops in the project vicinity. As seen in the photo below, the westbound bus stop for routes 25 and 928 is on the north curb of Clairemont Mesa Boulevard, just east of Ruffin Road and the eastbound bus stop for Route 25 is located on the south curb of Clairemont Mesa Boulevard, just west of Ruffin Road. This project is in discussions with MTS to relocate the eastbound bus stop for Route 25 to a location east of Ruffin Road along the project frontage, thus providing easy transit access to the hospital patients and visitors.

Table 3-1 summarizes the bus routes on various study area roadways. The MTS Route Maps and schedules are included in the ***Appendix A***.

TABLE 3-1
STUDY AREA TRANSIT ROUTES

Route #	Route	Approximate Hours of Operation		
		Weekday	**Saturday**	**Sunday**
20	Del Lago Transit Station - City College Trolley Station	5:00 AM to 9:30 PM	6:00 AM to 9:00 PM	7:00 AM to 8:30 PM
25	Kearny Mesa Transit Center - Fashion Valley Transit Center	7:00 AM to 7:00 PM	None	None
27	Felspar Street / Mission Boulevard intersection - Kearny Mesa Transit Center	5:30 AM to 10:00 PM	7:00 AM to 8:00 PM	None
120	Felspar Street / Mission Boulevard intersection - Kearny Mesa Transit Center	5:30 AM to 11:00 PM	6:00 AM to 10:30 PM	None
870	Ruffin Road / Aero Drive intersection - El Cajon Transit Center	6:30 AM to 8:00 AM and 4:00 PM to 5:30 PM	None	None
928	Kearny Mesa Transit Center - Fashion Valley Transit Center	6:00 AM to 8:00 PM	None	None
960	UTC Transit Center - Euclid Avenue Trolley Station	5:00 AM to 7:30 AM and 3:30 PM to 7:00 PM	None	None

Route 20 is an express route running between the Del Lago Transit Station in the City of Escondido and near the City College Trolley Station in downtown San Diego, which serves the Blue and Orange Trolley Line. On Clairemont Mesa Boulevard, it runs between Kearny Villa Road and Ruffin Road. On Ruffin Road, it runs between Kearny Villa Road and Clairemont Mesa Boulevard. During the weekdays, Route 20 operates from around 5:16 AM to 9:20 PM with about 15 to 30 minutes of headway. On Saturday, Route 20 operates from around 6:18 AM to 8:51 PM with about 15 to 30 minutes of headway except between 10 AM and 2 PM and between 4 PM and 7 PM when the headway is one hour. On Sunday, Route 20 operates from around 6:53 AM to 8:22 PM with an hour

of headway. Route 20 does not run along the project frontage but stops at the Clairemont Mesa Boulevard / Ruffin Road intersections, the northwest corner of the project site.

Route 25 runs between the Kearny Mesa Transit Center and the Fashion Valley Transit Center which serves the Green Trolley Line. On Clairemont Mesa Boulevard, it runs between the Clairemont Mesa Boulevard and Complex Drive intersection and the Clairemont Mesa Boulevard and La Cuenta Drive intersection (in Tierrasanta). Bus Route 25 operates only on weekdays from around 6:48 AM to 7:09 PM with about an hour of headway. Route 25 runs along the project frontage on Clairemont Mesa Boulevard. Hence, direct access to the project site is possible.

Route 27 runs between the Felspar Street and Mission Boulevard intersection in Pacific Beach and the Kearny Mesa Transit Center. On Clairemont Mesa Boulevard, it runs between Convoy Street and Complex Drive. Route 27 does not run along the project frontage but originates at the Kearny Mesa Transit Center which is approximately 3/4th mile west of the project site. The project site can be accessed by transferring to Route 20 at the Kearny Mesa Transit Center.

Route 120 runs between the Kearny Mesa Transit Center and the 4th Avenue / G Street intersection in downtown San Diego. On Clairemont Mesa Boulevard, it runs between Kearny Villa Road and the Clairemont Mesa Boulevard and Complex Drive intersection. On weekdays, Route 120 operates from around 5:33 AM to 10:53 PM with about 30 minutes of headway. On Saturday, Route 120 operates from around 6:05 AM to 10:30 PM with about an hour of headway. Route 120 does not run along the project frontage but originates at the Kearny Mesa Transit Center which is approximately 3/4th mile from the project site. The project site can be accessed by transferring to Route 20 at the Kearny Mesa Transit Center.

Route 870 is an express route running between the Ruffin Road / Aero Drive intersection and the El Cajon Transit Center which serves the Green and Orange Trolley Lines. On Clairemont Mesa Boulevard, it runs between Kearny Villa Road and Ruffin Road. On Ruffin Road, it runs between the SR-52 EB on-ramp and Clairemont Mesa Boulevard. Route 870 operates only on weekdays from around 6:38 AM to 8:02 AM and from around 4:04 PM to 5:29 PM with about 15 minutes of headway. Route 870 does not run along the project frontage but stops at the Clairemont Mesa Boulevard / Ruffin Road intersections, the northwest corner of the project site.

Route 928 runs between the Kearny Mesa Transit Center and the Fashion Valley Transit Center which serves the Green Line Trolley Line. On Clairemont Mesa Boulevard, it runs between the Clairemont Mesa Boulevard and Complex Drive intersection to the Clairemont Mesa Boulevard and Ruffin Road intersection. On Ruffin Road, it runs between Ruffin Road and Aero Drive. Along the project study area, Route 928 operates only on weekdays from around 5:53 AM to 8:13 PM with about 30 minutes of headway. Route 928 runs along the project frontage on Ruffin Road. Hence, direct access to the project site is possible.

Route 960 is an express route running between the UTC Transit Center and the Euclid Avenue Trolley Station which serves the Orange Line. On Clairemont Mesa Boulevard, it runs between Kearny Villa Road and Ruffin Road. On Ruffin Road, it runs between the SR-52 EB on-ramp and

Clairemont Mesa Boulevard. On Balboa Avenue, it runs between Kearny Villa road and the I-15 SB on-ramp. Route 960 only operates on weekdays from around 5:09 AM to 7:37 AM and from around 3:20 PM to 6:47 PM with about 15 to 30 minutes of headway. Route 20 does not run along the project frontage but stops at the Clairemont Mesa Boulevard / Ruffin Road intersections, the northwest corner of the project site.

As seen above, 5 of the 7 bus routes described, (Routes 20, 25, 870, 928 & 960) run along the project frontage on Ruffin Road or Clairemont Mesa Boulevard. The remaining two routes run through the Transit Center located on Complex Drive, south of Clairemont Mesa Boulevard, approximately 0.7 miles west of the site.

The aerial photo below depicts the existing bus stops surrounding the project site. As seen in the photo, there are 7 bus stops adjacent to the project site, four on Clairemont Mesa Boulevard and three on Ruffin Road. However, none of these are along the project frontage.

Table 3-2 summarizes the ridership data obtained from MTS for all the routes in the project vicinity for informational purposes only. As seen in *Table 3-2*, MTS Routes 20 and 120 have higher ridership than the other routes and Route 20 runs adjacent to the hospital.

TABLE 3-2
TRANSIT PASSENGER BOARDINGS

MTS Route	Average Weekday		Average Saturday		Average Sunday/Holiday	
	Daily	Hourly	Daily	Hourly	Daily	Hourly
20	4,097	35.0	2,022	30.8	1,304	24.0
25	425	16.8	-	-	-	-
27	1,052	19.3	266	16.4	165	15.4
120	3,567	33.1	2,166	28.8	1,399	34.5
870	69	13.4	-	-	-	-
928	1,283	27.2	498	32.8	264	26.1
960	366	26.5	-	-	-	-

3.4 Existing Traffic Volumes

Peak hour intersection turning movement volume counts and pedestrian counts were conducted by LLG at the study area intersections in January and April, 2012. ***Figure 3–2*** shows the Existing peak hour traffic volumes. ***Appendix B-1*** contains the peak hour manual count sheets and ***Appendix B-2*** includes signal timing plans from the City of San Diego and Caltrans.

Twenty four hour *daily volume* counts were conducted at the study area segments in January and April, 2012. *Figure 3–2* shows the Existing Traffic Volumes. ***Appendix B-3*** contains the tube count sheets.

Table 3–3 summarizes the existing average daily traffic volumes (ADTs).

TABLE 3-3
EXISTING TRAFFIC VOLUMES

Street Segment	ADT[a]
Clairemont Mesa Boulevard	
SR 163 NB Ramps to Kearny Villa Road	31,700
Kearny Villa Road to Complex Drive [b]	23,500
Complex Drive to Overland Avenue [b]	25,600
Overland Avenue to Ruffin Road [b]	23,200
Ruffin Road to Project Access Driveway	25,500
Project Access Driveway to Murphy Canyon Road [b]	25,500
Murphy Canyon Road to I-15	23,600
Lightwave Avenue	
Overland Avenue to Ruffin Road	6,300
Ruffin Court	
Ruffin Road to Project Driveway	1,900
Balboa Avenue	
Ponderosa Avenue to Ruffin Road	21,700
Ruffin Road to Viewridge Avenue	24,800
Viewridge Avenue to I-15	32,900
Viewridge Avenue	
South of Ruffin Court	2,900
North of Balboa Avenue	5,000
Ruffin Road	
SR 52 to Kearny Villa Road	20,100
Kearny Villa Road to Chesapeake Drive	15,700
Chesapeake Drive to Hazard Way	15,400
Hazard Way to Farnham Street	14,800
Farnham Street to Clairemont Mesa Boulevard	16,900
Clairemont Mesa Boulevard to Project Access Driveway	17,800
Project Access Driveway to Ruffin Court	18,500
Ruffin Court to Spectrum Center Boulevard	15,100
Spectrum Center Boulevard to Balboa Avenue	18,000

Footnotes:

a. Average Daily Traffic Volume counts conducted by LLG Engineers in January and April, 2012.

b. The traffic signals on Clairemont Mesa Boulevard from Kearny Villa Road to Murphy Canyon Road are coordinated.

3.5 Analysis of Existing Conditions

3.5.1 *Peak Hour Intersection Levels of Service*

Table 3-4 summarizes the existing peak hour intersection operations. As seen in *Table 3-4*, all study area intersections (Section 4.1) are calculated to currently operate at LOS D or better.

The existing peak hour analysis worksheets are included in ***Appendix C.***

3.5.2 *Daily Street Segment Levels of Service*

Table 3-5 summarizes the existing segment operations. As seen in *Table 3-5*, all study area segments (Section 4.1) are calculated to currently operate at LOS D or better.

3.5.3 *Freeway Mainline Analysis*

Table 3-6 summarizes the existing freeway mainline operations. As seen in *Table 3-6*, all study area freeway segments (Section 4.1) are calculated to currently operate at LOS D or better except one. The segment of SR 52 between Kearny Villa Road and I-15 is calculated to currently operate at LOS E in the WB direction during the AM peak hour.

3.5.4 *Freeway Ramp Meters*

The existing percentage of ramp traffic utilizing the HOV lane was determined for each of the on-ramps with HOV lanes from PeMS, by averaging the ramp volumes between August and December 2012. The percentages used in the analysis are as follows:

- WB Clairemont Mesa Boulevard to NB SR-163: 12%
- WB Clairemont Mesa Boulevard to SB SR-163: No HOV Lane
- Clairemont Mesa Boulevard to SB I-15: 11%
- Clairemont Mesa Boulevard to NB I-15: No HOV Lane
- Balboa Avenue SB I-15: 14%

The percentage calculations are included in ***Appendix B-5***.

CALCULATED DELAYS AND QUEUES

Table 3-7 summarizes the existing ramp meter operations for the Single Occupancy Vehicles (SOV) and High Occupancy Vehicles (HOV) lanes. As seen in *Table 3-7*, using the *most restrictive* discharge rates obtained from Caltrans, all HOV lanes operate with no delay or queues. However, the SOV lanes at the following ramps have calculated delays of 15 minutes or more:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp (SOV Lanes): Delay of 19 minutes with a 75-vehicle, or a 1,875-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp (SOV Lanes): Delay of 22 minutes with a 145-vehicle, or a 3,662-foot long queue.

The Ramp Meter data obtained from Caltrans is also included in *Appendix B-5*.

OBSERVED DELAYS AND QUEUES

The above calculated delays and queues are not observed in the field since the calculations assume the most restrictive discharge rates for the entire peak hour. However, in the field, the discharge rate varies with the volume of traffic on the freeway mainline, with the discharge rate being low (restrictive) on the ramps when the freeway mainline volumes are high and vice versa. The actual maximum queues and delays observed in the field at the three on-ramps listed above during the PM peak hour are much lower than the calculated values and are shown below. Thus, the existing delays at the study area on-ramp meters are within acceptable limits (less than 15 minutes). The field observations at the on-ramps are included in *Appendix B-5*.

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 1 minute with a 7-vehicle queue (or, approximately 175 feet from the ramp meter).
- Balboa Avenue / SB I-15 On-Ramp: Queue – Delay of 6 minutes with a 46-vehicle queue (or, approximately 575 feet from the ramp meter).

3.5.5 *Intersecting Lane Vehicle (ILV) Analysis*

Table 3-8 summarizes the ILV calculations for the freeway interchanges within the study area. As seen in this table, all study area interchanges are calculated to currently operate at under or near capacity with the following exception which was calculated to operate at over capacity during both the AM and PM peak hours:

- Clairemont Mesa Boulevard/ I–15 SB intersection

TABLE 3–4
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay[a]	LOS[b]
1. Clairemont Mesa Blvd / Kearny Mesa Rd	Signal	AM	17.0	B
		PM	28.5	C
2. Clairemont Mesa Blvd / SR 163 SB Ramps	MSSC [c]	AM	13.4	B
		PM	11.6	B
3. Clairemont Mesa Blvd / SR 163 NB Ramps	Signal	AM	19.7	B
		PM	12.5	B
4. Clairemont Mesa Blvd / Kearny Villa Rd [d]	Signal	AM	17.1	B
		PM	18.7	B
5. Clairemont Mesa Blvd / Complex Drive [d]	Signal	AM	15.6	B
		PM	15.6	B
6. Clairemont Mesa Blvd / Overland Ave [d]	Signal	AM	29.3	C
		PM	30.8	C
7. Clairemont Mesa Blvd / Ruffin Rd [d]	Signal	AM	33.5	C
		PM	40.6	D
8. Clairemont Mesa Blvd / Project Dwy #1 [e]	DNE	AM	DNE	DNE
		PM	DNE	DNE
9. Clairemont Mesa Blvd / Murphy Canyon Rd [d]	Signal	AM	12.1	B
		PM	21.5	C
10. Clairemont Mesa Blvd / I-15 SB Ramps	Signal	AM	23.6	C
		PM	22.9	C
11. Clairemont Mesa Blvd / I-15 NB Ramps	Signal	AM	23.6	C
		PM	14.7	B
12. Lightwave Ave / Overland Ave	Signal	AM	15.9	B
		PM	19.0	B
13. Ruffin Rd / SR 52 WB Ramps	Signal	AM	20.7	C
		PM	14.3	B

CONTINUED IN THE NEXT PAGE

TABLE 3–4 (CONTINUED)
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Delay[a]	LOS[b]
14. Ruffin Rd / SR 52 EB Ramps	Signal	AM	14.4	B
		PM	42.0	D
15. Ruffin Rd / Kearny Villa Rd	Signal	AM	12.9	B
		PM	17.5	B
16. Ruffin Rd / Chesapeake Dr	Signal	AM	10.1	B
		PM	12.9	B
17. Ruffin Rd / Hazard Wy	Signal	AM	9.1	A
		PM	11.0	B
18. Ruffin Rd / Farnham St	Signal	AM	8.5	A
		PM	12.6	B
19. Ruffin Road / Proj Dwy #2 [e]	MSSC	AM	DNE	DNE
		PM	DNE	DNE
20. Ruffin Rd / Ruffin Ct	Signal	AM	18.7	B
		PM	22.0	C
21. Ruffin Rd / Spectrum Center Blvd	Signal	AM	13.0	B
		PM	17.8	B
22. Ruffin Rd / Balboa Ave	Signal	AM	45.9	D
		PM	38.5	D
23. Viewridge Ave / Balboa Ave	Signal	AM	16.1	B
		PM	33.5	C
24. Ruffin Ct / Project Dwy #3 [e]	MSSC	AM	DNE	DNE
		PM	DNE	DNE
25. Ruffin Ct / Project Dwy #4 [e]	MSSC	AM	DNE	DNE
		PM	DNE	DNE

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. MSSC – Minor Street Stop Controlled intersection. Minor street approach / left turn delay is reported.
d. These intersections are part of a coordinated signal system
e. The project driveways are not analyzed in the "no project" conditions since they will be relocated in the future or do not currently exist.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 3–5
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Existing Functional Classification	Capacity at LOS E [a]	ADT [b]	LOS [c]	V/C [d]
Clairemont Mesa Boulevard					
SR 163 NB Ramps to Kearny Villa Rd	6-lane Prime	60,000	31,700	B	0.528
Kearny Villa Rd to Complex Dr	6-lane Major	50,000	23,500	B	0.470
Complex Dr to Overland Ave	6-lane Major	50,000	25,600	B	0.512
Overland Ave to Ruffin Rd	6-lane Major	50,000	23,200	B	0.464
Ruffin Rd to Project Access Dwy	5-lane Major	45,000	25,500	C	0.567
Project Access Dwy to Murphy Canyon Rd	5-lane Major	45,000	25,500	C	0.567
Murphy Canyon Rd to I-15	6-lane Major	50,000	23,600	B	0.472
Lightwave Avenue					
Overland Ave to Ruffin Rd	4-Lane Collector	30,000	6,300	A	0.210
Ruffin Court					
Ruffin Rd to Project Dwy	2-Lane Collector	15,000	1,900	A	0.127
Balboa Avenue					
Ponderosa Ave to Ruffin Rd	4-Lane Major	40,000	21,700	C	0.543
Ruffin Rd to Viewridge Ave	6-Lane Prime	60,000	24,800	A	0.413
Viewridge Ave to I-15	6-Lane Prime	60,000	32,900	B	0.548
Viewridge Avenue					
South of Ruffin Ct	2-Lane Collector	15,000	2,900	A	0.193
North of Balboa Ave	2-Lane Collector	15,000	5,000	A	0.333
Ruffin Road					
SR 52 to Kearny Villa Rd	4-Lane Major	40,000	20,100	B	0.503
Kearny Villa Rd to Chesapeake Dr	4-Lane Collector	30,000	15,700	C	0.523
Chesapeake Dr to Hazard Wy	4-Lane Collector	30,000	15,400	C	0.513
Hazard Wy to Farnham St	4-Lane Collector	30,000	14,800	C	0.493
Farnham St to Clairemont Mesa Blvd	4-Lane Collector	30,000	16,900	C	0.563
Clairemont Mesa Blvd to Project Access Dwy	4-Lane Collector	30,000	17,800	C	0.593
Project Access Dwy to Ruffin Ct	4-Lane Collector	30,000	18,500	C	0.617
Ruffin Ct to Spectrum Ctr Blvd	4-Lane Collector	30,000	15,100	C	0.503
Spectrum Ctr Blvd to Balboa Ave	4-Lane Collector	30,000	18,000	C	0.600

Footnotes:

a. Capacities based on City of San Diego Roadway Classification Table.
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity ratio.
e. TWLTL – Two-Way Left-Turn Lane.

TABLE 3-6
PEAK HOUR FREEWAY MAINLINE OPERATIONS
EXISTING

Freeway Segment	Dir.	# of Lanes [a]	Hourly Capacity[b]	ADT [c]	% K [d]		% D [d]		Truck Factor [e]	Peak Hour Volume [f]		V/C [g]		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
Interstate 15															
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	161,700	0.0813	0.0792	0.4735	0.4678	0.9627	6,466	6,223	0.808	0.778	D	C
	SB	4	8,000		0.0813	0.0792	0.5265	0.5322		7,190	7,080	0.899	0.885	D	D
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	163,300	0.0813	0.0792	0.4735	0.4678	0.9627	6,530	6,285	0.710	0.683	C	C
	SB	4 + 1	9,200		0.0813	0.0792	0.5265	0.5322		7,261	7,150	0.789	0.777	C	C
Balboa Ave to Aero Dr	NB	4 + 1	9,200	174,600	0.0813	0.0792	0.4735	0.4678	0.9627	6,982	6,720	0.759	0.730	C	C
	SB	4 + 1	9,200		0.0813	0.0792	0.5265	0.5322		7,763	7,645	0.844	0.831	D	D
SR 163															
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	120,000	0.0858	0.0923	0.4792	0.4931	0.9717	5,078	5,621	0.552	0.611	B	B
	SB	4 + 1	9,200		0.0858	0.0923	0.5208	0.5069		5,518	5,778	0.600	0.628	B	C
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	139,700	0.0858	0.0923	0.4792	0.4931	0.9717	5,911	6,543	0.643	0.711	C	C
	SB	4 + 1	9,200		0.0858	0.0923	0.5208	0.5069		6,424	6,726	0.698	0.731	C	C
SR 52															
SR 163 to Kearny Villa Rd	WB	3	6,000	65,000	0.0996	0.0903	0.5962	0.4246	0.9690	3,983	2,572	0.664	0.429	C	B
	EB	3	6,000		0.0996	0.0903	0.4038	0.5754		2,698	3,485	0.450	0.581	B	B
Kearny Villa Road to I-15	WB	2	4,000	65,000	0.0996	0.0903	0.5962	0.4246	0.9690	3,983	2,572	0.996	0.643	E	C
	EB	2	4,000		0.0996	0.0903	0.4038	0.5754		2,698	3,485	0.674	0.871	C	D

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.
b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.
c. Existing ADT Volumes from PeMS (Year 2012)
d. Peak Hour Percentage (K) and Direction Split (D) from CALTRANS, 2010
e. Truck Factor from "2010 Annual Average Daily Truck Traffic on the California State Highway System".
f. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
g. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 3-7
EXISTING RAMP METER ANALYSIS

Location/Condition	Peak Hour [a]	Demand D (veh/hr/ln)	Meter Rate [c] (R) (veh/hr/ln)	Calculated (Most Restrictive)			Maximum Observed [g]		
				Excess Demand [d] E (veh/hr/ln)	Delay [e] (min/ln)	Queue [f]	Delay (Min)	Queue	
								Veh/Ln	Feet
Clairemont Mesa Boulevard / SR 163 Interchange									
WB Clairemont Mesa Boulevard to NB SR 163			12% Reduction in SOV lane volume due to HOV lane				1 SOV+1 HOV		
SOV	PM	481	593	0	0	0	0	0	0
HOV	PM	66	593	0	0	0	0	0	0
WB Clairemont Mesa Boulevard to SB SR 163								2 SOV	
SOV	PM	375	514	0	0	0	0	0	0
Clairemont Mesa Boulevard / I-15 Interchange									
EB Clairemont Mesa Boulevard to NB I-15								2 SOV	
SOV	PM	313	238	75	19	1,875	1	7	175
EB Clairemont Mesa Boulevard to SB I-15			11% Reduction in SOV lane volume due to HOV lane				2 SOV+1 HOV		
SOV	PM	343	312	31	6	777	2	24	600
HOV	PM	85	312	0	0	0	0	0	0
Balboa Avenue / I-15 Interchange									
EB Balboa Avenue to SB I-15			14% Reduction in SOV lane volume due to HOV lane				2 SOV+1 HOV		
SOV	PM	517	372	145	23	3,622	6	46	1,150
HOV	PM	168	372	0	0	0	0	0	0

Footnotes:

a. Analysis of the AM peak hour is not included since the ramp meter does not operate during the AM peak hour, but only during the PM peak hour.
b. Demand "D" is the traffic that desires to enter the freeway at this on-ramp during the peak hour.
c. Meter Rate "R" is the *most restrictive* rate at which the ramp meter (signal) discharges traffic on to the freeway (See Appendix B-5 for the ramp meter data obtained from Caltrans).
d. Excess Demand "E" is the difference between the Demand and the Peak Hour Flow.
e. Delay in minutes per lane experienced by each vehicle, calculated as the ratio of the Excess Demand and the Peak Hour Flow in one minute.
f. Queue is calculated as 25 feet per vehicle (E).
g. Actual Delay and Queue observed in the field.

TABLE 3–8
EXISTING ILV OPERATIONS

Intersection	Peak Hour	Total Operating Level (ILV / Hour)	Capacity
3. Clairemont Mesa Boulevard / SR-163 NB Ramps	AM	1,260	Near
	PM	762	Under
10. Clairemont Mesa Boulevard / I-15 SB Ramps	AM	1,778	Over
	PM	1,712	Over
11. Clairemont Mesa Boulevard / I-15 NB Ramps	AM	1,278	Near
	PM	1,049	Under
13. Ruffin Road / SR-52 WB Ramps	AM	829	Under
	PM	1,278	Near
14. Ruffin Road / SR-52 WB Ramps	AM	695	Under
	PM	1,198	Under

General Notes:

a. See *Appendix C* for ILV calculation sheets.

b. CAPACITY is shown as *UNDER* capacity, *NEAR* capacity or *OVER* capacity:
Under *Capacity* = <1200 ILV/Hour
Near Capacity = >1200 but < 1500 ILV/Hour
Over Capacity = >1500 ILV/Hour

General Note:
The Clairemont Mesa Boulevard / SR-163 SB ramps intersection is not analyzed since it is not signalized.

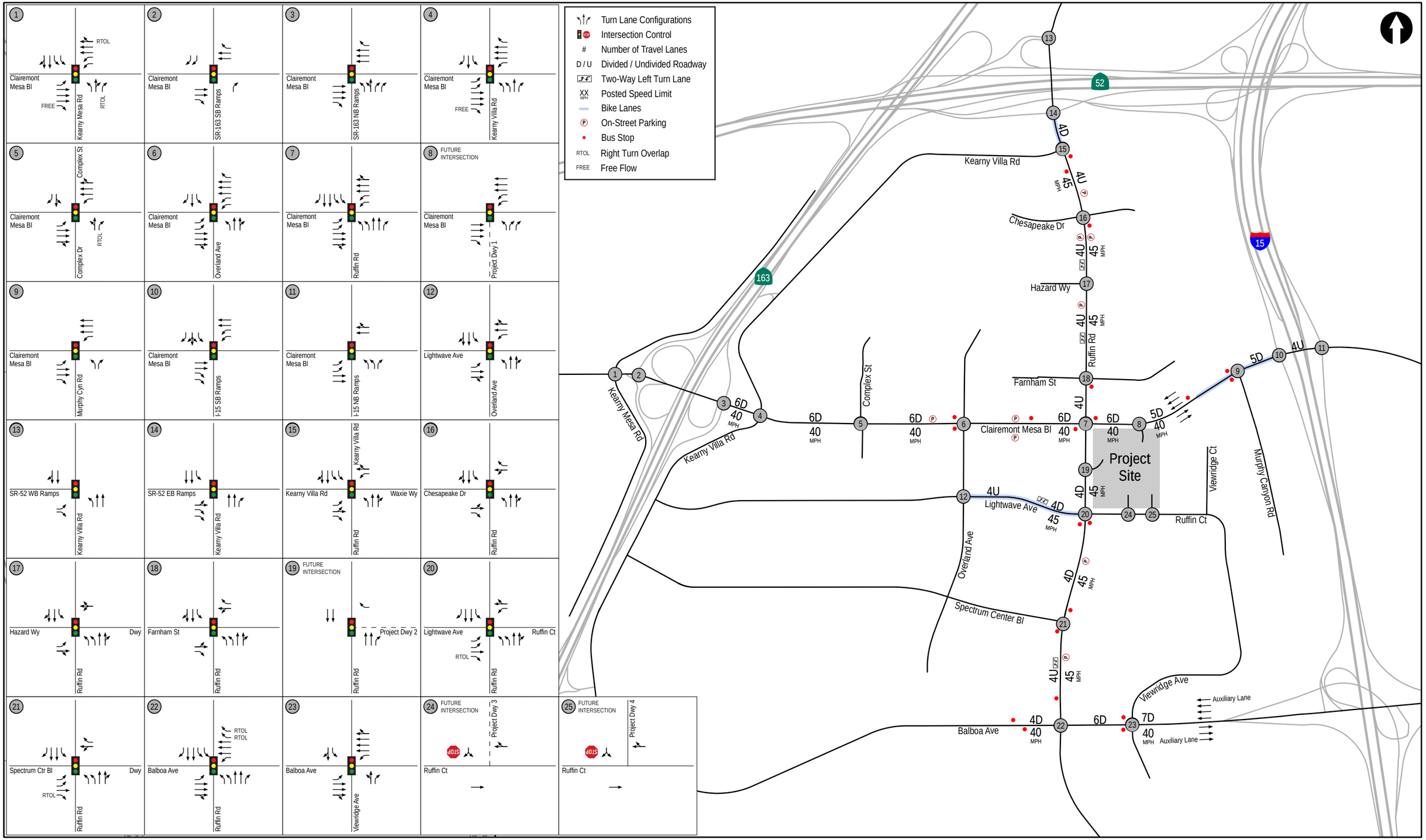

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Figure 3-1

Existing Conditions Diagram

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

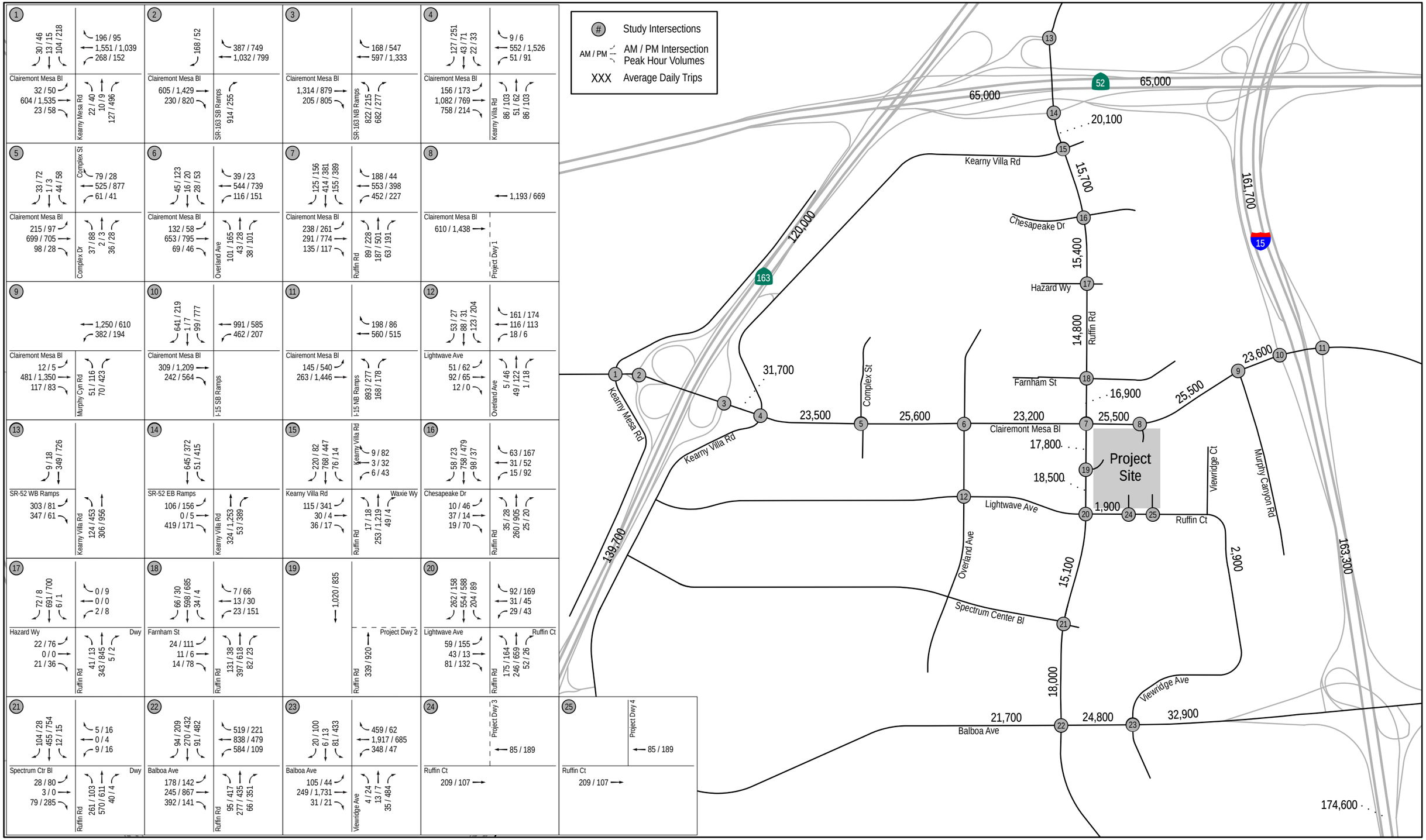

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Figure 3-2

Existing Traffic Volumes

Kaiser San Diego Central Medical Center

STUDY AREA AERIAL PHOTOS

Study Area Intersections

1. Clairemont Mesa Boulevard / Kearny Mesa Road

2. Clairemont Mesa Boulevard / SR 163 SB Ramps

3. Clairemont Mesa Boulevard / SR 163 NB Ramps

4. Clairemont Mesa Boulevard / Kearny Villa Road

5. Clairemont Mesa Boulevard / Complex Street

6. Clairemont Mesa Boulevard / Overland Avenue

STUDY AREA AERIAL PHOTOS (CONTINUED)

STUDY AREA INTERSECTIONS

7. Clairemont Mesa Boulevard / Ruffin Road

8. Clairemont Mesa Boulevard / Project Driveway #1

9. Clairemont Mesa Boulevard / Murphy Canyon Road

10. Clairemont Mesa Boulevard / I-15 SB Ramps

11. Clairemont Mesa Boulevard / I-15 NB Ramps

12. Lightwave Avenue / Overland Avenue

STUDY AREA AERIAL PHOTOS (CONTINUED)

STUDY AREA INTERSECTIONS

13. Kearny Villa Road / SR 52 WB Ramps

14. Kearny Villa Road / SR 52 EB Ramps

15. Kearny Villa Road / Ruffin Road

16. Ruffin Road / Chesapeake Drive

17. Ruffin Road / Hazard Way

18. Ruffin Road / Farnham Street

STUDY AREA AERIAL PHOTOS (CONTINUED)

STUDY AREA INTERSECTIONS

19. Project Driveway #2 / Ruffin Road

22. Balboa Avenue / Ruffin Road

20. Lightwave Avenue / Ruffin Road

23. Balboa Avenue / Viewridge Avenue

21. Spectrum Center Boulevard / Ruffin Road

25. Ruffin Court / Driveway #4

STUDY AREA AERIAL PHOTOS (CONTINUED)

Study Area Segments

Clairemont Mesa Boulevard
SR 163 NB Ramps to Kearny Villa Road

Clairemont Mesa Boulevard
Ruffin Road to Proposed Project Driveway

Clairemont Mesa Boulevard
Overland Avenue to Ruffin Road

Clairemont Mesa Boulevard
Murphy Canyon Road to I-15 Ramps

Clairemont Mesa Boulevard
Project Driveway to Murphy Canyon Road

Kearny Villa Road
SR 52 Ramps to Ruffin Road

Clairemont Mesa Boulevard
Kearny Villa Road to Overland Avenue

Ruffin Road
Clairemont Mesa Boulevard to Ruffin Court

STUDY AREA AERIAL PHOTOS (CONTINUED)

STUDY AREA SEGMENTS

Ruffin Road
Spectrum Center Boulevard to Balboa Avenue

Ruffin Road
Ruffin Court to Spectrum Center Boulevard

Balboa Avenue
Ruffin Road to Viewridge Avenue

Balboa Avenue
Ponderosa Avenue to Ruffin Road

Ruffin Road
Kearny Villa Road to Clairemont Mesa Boulevard

Balboa Avenue
Viewridge Avenue to I-15 Ramps

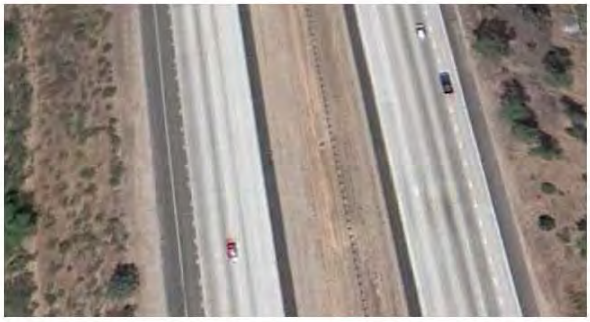
STUDY AREA AERIAL PHOTOS (CONTINUED)

Study Area Freeway Segments

State Route 163
State Route 52 to Clairemont Mesa Boulevard

State Route 163
Clairemont Mesa Boulevard to Balboa Avenue

Interstate 15
State Route 52 to Clairemont Mesa Boulevard



Interstate 15
Clairemont Mesa Boulevard to Balboa Avenue

State Route 52
Interstate 805 to State Route 163

State Route 52
Kearny Villa Road to Interstate 15

STUDY AREA AERIAL PHOTOS (CONTINUED)

Freeway On-Ramps

WB Clairemont Mesa Boulevard On-Ramp to SB 163

WB Clairemont Mesa Boulevard On-Ramp to NB 163

Clairemont Mesa Boulevard On-Ramp to SB 15

Clairemont Mesa Boulevard On-Ramp to NB 15

STUDY AREA AERIAL PHOTOS (CONTINUED)

FREEWAY ON-RAMPS

EB Balboa Avenue On-Ramp to SB 15

4.0 ANALYSIS APPROACH AND METHODOLOGY

4.1 Study Area

The study area was determined based on City of San Diego Traffic Impact Study Manual and the SANTEC/ITE Regional Guidelines for Traffic Impact Studies which require that a project study area be established as follows:

- All street segments where the project will add 50 or more peak hour trips in either direction.
- Mainline freeway locations where the project will add 50 or more peak hour trips in either direction.
- Metered Freeway Ramps where the project will add 20 or more peak hour trips.

In addition, the study area locations were selected based on the project's trip distribution and are the most likely locations to be impacted by project. The project study area includes the following locations:

INTERSECTIONS:

1. Clairemont Mesa Boulevard / Kearny Mesa Road (Signal)
2. Clairemont Mesa Boulevard / SR 163 SB Ramps (Minor Street Stop)
3. Clairemont Mesa Boulevard / SR 163 NB Ramps (Signal)
4. Clairemont Mesa Boulevard / Kearny Villa Road (Signal)
5. Clairemont Mesa Boulevard / Complex Drive (Signal)
6. Clairemont Mesa Boulevard / Overland Avenue (Signal)
7. Clairemont Mesa Boulevard / Ruffin Road (Signal)
8. Clairemont Mesa Boulevard / Project Access Driveway #1 (Signal)
9. Clairemont Mesa Boulevard / Murphy Canyon Road (Signal)
10. Clairemont Mesa Boulevard / I-15 SB Ramps (Signal)
11. Clairemont Mesa Boulevard / I-15 NB Ramps (Signal)
12. Lightwave Avenue / Overland Avenue (Signal)
13. Kearny Villa Road / SR 52 WB Ramps (Signal)
14. Kearny Villa Road / SR 52 EB Ramps (Signal)
15. Ruffin Road / Kearny Villa Road (Signal)
16. Ruffin Road / Chesapeake Drive (Signal)
17. Ruffin Road / Hazard Way (Signal)
18. Ruffin Road / Farnham Street (Signal)
19. Ruffin Road / Project Access Driveway #2 (Minor Street Stop)
20. Ruffin Road / Ruffin Court (Signal)
21. Ruffin Road / Spectrum Center Boulevard (Signal)
22. Ruffin Road / Balboa Avenue (Signal)
23. Viewridge Avenue / Balboa Avenue (Signal)

24. Ruffin Court / Project Access Driveway #3 (Minor Street Stop)
25. Ruffin Court / Project Access Driveway #4 (Minor Street Stop)

Note: Intersections #4 through #9, except #8 (which does not currently exist) are coordinated.

SEGMENTS:

1. Clairemont Mesa Boulevard: SR 163 NB Ramps to Kearny Villa Road
2. Clairemont Mesa Boulevard: Kearny Villa Road to Complex Drive
3. Clairemont Mesa Boulevard: Complex Drive to Overland Avenue
4. Clairemont Mesa Boulevard: Overland Avenue to Ruffin Road
5. Clairemont Mesa Boulevard: Ruffin Road to Project Main Access
6. Clairemont Mesa Boulevard: Project Main Access to Murphy Canyon Road
7. Clairemont Mesa Boulevard: Murphy Canyon Road to I-15
8. Lightwave Avenue: Overland Avenue to Ruffin Road
9. Ruffin Court: Ruffin Road to Project Driveway
10. Balboa Avenue: Ponderosa Avenue to Ruffin Road
11. Balboa Avenue: Ruffin Road to Viewridge Avenue
12. Balboa Avenue: Viewridge Avenue to I-15
13. Viewridge Avenue: South of Viewridge Court
14. Viewridge Avenue: North of Balboa Avenue
15. Ruffin Road: SR 52 to Kearny Villa Road
16. Ruffin Road: Kearny Villa Road to Chesapeake Drive
17. Ruffin Road: Chesapeake Drive to Hazard Way
18. Ruffin Road: Hazard Way to Farnham Street
19. Ruffin Road: Farnham Street to Clairemont Mesa Boulevard
20. Ruffin Road: Clairemont Mesa Boulevard to Project Access
21. Ruffin Road: Project Access to Ruffin Court
22. Ruffin Road: Ruffin Court to Spectrum Center Boulevard
23. Ruffin Road: Spectrum Center Boulevard to Balboa Avenue

FREEWAY SEGMENTS:

1. SR 163: SR 52 to Clairemont Mesa Boulevard
2. SR 163: Clairemont Mesa Boulevard to Balboa Avenue
3. I-15: SR 52 to Clairemont Mesa Boulevard
4. I-15: Clairemont Mesa Boulevard to Balboa Avenue
5. I-15: Balboa Avenue to Aero Drive

METERED FREEWAY ON-RAMPS:

1. Clairemont Mesa Boulevard WB to SB SR 163
2. Clairemont Mesa Boulevard WB to NB SR 163
3. Clairemont Mesa Boulevard to SB I-15

4. Clairemont Mesa Boulevard to NB I-15
5. Balboa Avenue EB to SB I-15

4.2 Analysis Approach

This traffic analysis assesses the above mentioned key intersections, street segments, freeway mainline segments and freeway On-Ramps, in the project area. Based on current membership growth, only 350 beds and 75,000 SF of medical Office space is required (Project Phase 1). Thus, project buildout will occur only in 2030. The study area locations were analyzed in the following scenarios to determine the potential impacts to the road network:

- Existing
- Existing + Project Phase I (Year 2017)
- Existing + Entire Project (2030)
- Near-Term (Existing + Cumulative Projects)
- Near-Term + Project Phase I (Year 2017)
- Near-Term + Entire Project (Year 2030)
- Year 2035 Without Project
- Year 2035 With Entire Project

4.3 Methodology

There are various methodologies used to analyze signalized intersections, unsignalized intersections and street segments. The measure of effectiveness for intersection and segment operations is level of service which denotes the operating conditions which occur at a given intersection or on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Levels of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

In the 2000 Highway Capacity Manual (HCM), Level of Service for signalized intersections is defined in terms of delay. The level of service analysis results in seconds of delay expressed in terms of letters A through F. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. ***Table 4-1*** summarizes the signalized intersections levels of service descriptions.

4.3.1 *Signalized Intersections*

Table 4-2 depicts the criteria, which are based on the average control delay for any particular minor movement (unsignalized intersections) and overall intersection (signalized intersections).

For signalized intersections, level of service criteria is stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

TABLE 4-1
INTERSECTION LEVEL OF SERVICE DESCRIPTIONS

Level of Service	Description
A	Occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.
F	Considered to be unacceptable to most drivers. This condition often occurs with over saturation i.e. when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume-to-capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels

TABLE 4–2
INTERSECTION LOS & DELAY RANGES

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	≥ 80.1	≥ 50.1

Source: 2000 Highway Capacity Manual

Level of service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of service B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of Average delay.

Level of service C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of service D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are frequent.

Level of service E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

4.3.2 *Unsignalized Intersections*

For unsignalized intersections, level of service is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole.

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits.

LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

4.3.3 *Street Segments*

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The City of San Diego's *Roadway Classification, Level of Service and ADT* table is shown in ***Table 4–3.***

TABLE 4–3
LEVEL OF SERVICE THRESHOLDS FOR ROADWAY SEGMENTS

Classification	(# of Lanes)	Level of Service				
		A	B	C	D	E
Freeway	8	60,000	84,000	120,000	140,000	150,000
Freeway	6	45,000	63,000	90,000	110,000	120,000
Freeway	4	30,000	42,000	60,000	70,000	80,000
Expressway	6	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6	25,000	35,000	50,000	55,000	60,000
Major Arterial	6	20,000	28,000	40,000	45,000	50,000
Major Arterial	4	15,000	21,000	30,000	35,000	40,000
Collector	4	10,000	14,000	20,000	25,000	30,000
Collector (no center lane or continuous left-turn lane)	4 2	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industry fronting)	2	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2	2,500	3,500	5,000	6,500	8,000
Collector (single-family)	2	—	—	2,200	—	—

Notes:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.
2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

Source: City of San Diego Traffic Impact Study Manual

4.3.4 *Freeway Mainline*

Freeway segments were analyzed for all analysis scenarios. The assessment of key freeway segments is necessary to satisfy the requirement of the Congestion Management Program (CMP), as outlined later in the report. Freeway segment LOS is based on the volume to capacity ratio on the freeway. The analysis of freeway segment LOS is based on the procedure developed by CALTRANS District 11 based on methods described in the *Highway Capacity Manual*. The procedure involves comparing the peak hour volume of the mainline segment to the theoretical capacity of the roadway (V/C).

The procedure for calculating freeway LOS involves the estimation of volume to capacity (V/C) ratio using the following equation:

$$V/C = \frac{\text{(Daily Volume * Peak Hour Percent * Directional Factor * Truck Factor)}}{\text{Capacity}}$$

a. *Notes:*
b. *Daily Volume* = Annual Average Daily Traffic (AADT)
c. *Peak Hour Percent* = Percentage of ADT occurring during the peak hour.
d. Directional Factor = Percentage of peak hour traffic occurring in peak direction.
e. *Truck Factor* = Truck/terrain factor to represent influence of heavy vehicles & grades.
f. *Capacity* = 2,000 vehicles/lane/hour/lane for mainline, and1,200 for auxiliary lanes.

The resulting V/C is then compared to accepted ranges of V/C values corresponding to the various Levels of Service for each facility classification, as shown in ***Table 4–4***. The corresponding Level of Service represents an approximation of existing or anticipated future freeway operating condition in the peak direction of travel during the peak hour. The Year 2012 Freeway Volumes (PeMS) and the K & D Factors are included in *Appendix B-2*.

TABLE 4–4
CALTRANS DISTRICT 11 - FREEWAY SEGMENT LEVEL OF SERVICE DEFINITIONS

LOS	V/C	Congestion / Delay	Traffic Description
USED FOR FREEWAYS, EXPRESSWAYS AND CONVENTIONAL HIGHWAYS			
A	<0.41	None	Free flow
B	0.42-0.62	None	Free to stable flow, light to moderate volumes.
C	0.63-0.80	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted
D	0.81-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
E	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
USED FOR FREEWAYS AND EXPRESSWAYS			
F(0)	1.01-1.25	Considerable 0-1 hour delay	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
F(l)	1.26-1.35	Severe 1-2 hour delay	Very heavy congestion, very long queues.
F(2)	1.36-1.45	Very Severe 2-3 hour delay	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
F(3)	**>1.46**	**Extremely Severe : 3+ hours of delay**	**Gridlock**

4.3.5 *Freeway Ramp Meters*

A ramp meter analysis was conducted at the six on-ramps in the study area. As mentioned previously, the following ramps are currently metered during the AM and / or PM peak hour as indicated. The SR 52 / Ruffin Road EB and WB on-Ramps are not currently metered.

BACKGROUND

The measure of effectiveness (MOE) for this analysis is delay in minutes. Ramp meter flow rates characteristically vary throughout the peak hour based on the performance of the freeway mainline. As the mainline becomes more congested, the ramp meter rates decline, allowing fewer vehicles onto the freeway in the same time period.

The metering information was obtained from Caltrans for each of the ramps listed above and is included in *Appendix B-5*.

ANALYSIS METHODOLOGY

CALCULATED

The ramp meters were analyzed using the Fixed Rate Method. With the Fixed Rate Method, using the most restrictive flow rate during the peak hour, the total discharge and delay (in minutes) are calculated and the corresponding queue lengths are calculated.

OBSERVED

The actual observed maximum queues and delays during the peak hours are generally lesser than the calculated delays. Hence, the actual observed maximum queue and delays are also reported for comparison. The existing observed maximum queues and delays are summarized below:

Ramp	**Peak Hour**	**Maximum Observed**		
		Delay (Minutes)	**Queue (Vehicles/Hour/Lane)**	**Feet**
WB Clairemont Mesa Boulevard to NB SR 163				
SOV	PM	0	0	0
HOV	PM	0	0	0
WB Clairemont Mesa Boulevard to SB SR 163				
SOV	PM	0	0	0
EB Clairemont Mesa Boulevard to NB I-15				
SOV	PM	1	7	175
EB Clairemont Mesa Boulevard to SB I-15				
SOV	PM	2	24	600
HOV	PM	0	0	0
EB Balboa Avenue to SB I-15				
SOV	PM	6	46	1,150
HOV	PM	0	0	0

4.4 ILV (Intersecting Lane Vehicles) Operations

Caltrans requires that State-owned intersections be analyzed using Intersecting Lane Vehicles (ILV) methodology as described in Chapter 400, Topic 406 of the Department Highway Design Manual. The ILV methodology is based on the concept that capacity of intersecting lanes of traffic is 1,500 vehicles per hour. For the typical local street interchange there is usually a critical intersection of a ramp and the crossroads that establishes the capacity of the interchange. However, neither Caltrans nor the City of San Diego utilizes ILV results as a measure of effectiveness when determining impacts. Therefore, ILV summaries are shown for informational purposes. Interchanges along SR–163, I–15, and SR–52 were analyzed.

TABLE 4-5
ILV CAPACITIES

UNDER (ILV/hr<1200)	NEAR (ILV/hr 1200 – 1500)	OVER (ILV/hr >1500)
Denotes stable flow with slight but acceptable delay. Occasional signal loading may develop. Free mid-block operations.	Denotes unstable flow with considerable delay. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs at some approaches.	Denotes stop and go operation with severe delay and heavy congestion [a]. Traffic volume is limited by maximum discharge rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

Footnotes:

a. The amount of congestion depends on how much the ILV/hr value exceeds 1,500. Observed flow rates will normally not exceed 1,500 ILV/hr and the excess will be delayed in a queue

5.0 SIGNIFICANCE CRITERIA

According to the City of San Diego's *Significance Determination Thresholds* dated January 2011, a project is considered to have a significant impact if project traffic would decrease the operations of surrounding roadways by a defined threshold. The City defined thresholds are shown in ***Table 5–1***.

The impact is designated either a "direct" or "cumulative" impact. According to the City's *Significance Determination Thresholds*,

> "*Direct* traffic impacts are those projected to occur at the time a proposed development becomes operational, including other developments not presently operational but which are anticipated to be operational at that time (near term)."
>
> "*Cumulative* traffic impacts are those projected to occur at some point after a proposed development becomes operational, such as during subsequent phases of a project and when additional proposed developments in the area become operational (short-term cumulative) or when affected community plan area reaches full planned buildout (long-term cumulative)."
>
> It is possible that a project's near term (direct) impacts may be reduced in the long term, as future projects develop and provide additional roadway improvements (for instance, through implementation of traffic phasing plans). In such a case, the project may have direct impacts but not contribute considerably to a cumulative impact."
>
> For intersections and roadway segments affected by a project, level of service (LOS) D or better is considered acceptable under both direct and cumulative conditions."

A significant impact is determined if:

1. If any intersection, roadway segment, or freeway segment affected by a project would operate at LOS E or F under either direct or cumulative conditions, or, if a project would degrade the LOS on a facility from acceptable to unacceptable level, the impact would be significant if the project exceeds the thresholds shown in *Table 5-1*.
2. At any ramp meter location with delays above 15 minutes, the impact would be significant if the project exceeds the thresholds shown in *Table 5-1*.
3. If a project would add a substantial amount of traffic to a congested freeway segment, interchange, or ramp, the impact may be significant.
4. Addition of a substantial amount of traffic to a congested freeway segment, interchange, or ramp as shown in *Table 5-1*.

TABLE 5–1
CITY OF SAN DIEGO
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project[b]	Allowable Increase Due to Project Impacts[a]					
	Freeways		Roadway Segments		Intersections	Ramp Metering[c]
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E	0.010	1.0	0.02	1.0	2.0	2.0
F	0.005	0.5	0.01	0.5	1.0	1.0

Footnotes:

a. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. The project applicant shall then identify feasible improvements (within the Traffic Impact Study) that will restore/and maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note b), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating the project's direct significant and/or cumulatively considerable traffic impacts.

b. All LOS measurements are based upon Highway Capacity Manual procedures for peak-hour conditions. However, V/C ratios for roadway segments are estimated on an ADT/24-hour traffic volume basis (using Table 2 of the City's Traffic Impact Study Manual). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped locations). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

c. The allowable increase in delay at a ramp meter with more than 15 minutes delay and freeway LOS E is 2 minutes. The allowable increase in delay at a ramp meter with more than 15 minutes delay and freeway LOS F is 1 minute.

General Notes:

1. Delay = Average control delay per vehicle measured in seconds for intersections or minutes for ramp meters
2. LOS = Level of Service
3. V/C = Volume to Capacity ratio
4. Speed = Arterial speed measured in miles per hour

6.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

6.1 Existing Site Traffic

The site is currently occupied by a County of San Diego office building. In order to determine the net increase in traffic due to the project, the current traffic generated by the project site is deducted from the total forecasted traffic generated by the proposed project. As allowed by the City of San Diego, if the existing facility has been occupied within six months prior to the existing traffic counts, the amount of traffic generated during the six months prior to the traffic counts may be deducted from the total traffic generated by the proposed project. Since the traffic counts were conducted in January 2012, this corresponds to June 2011.

The trips generated by the existing County Annex Office at the project site were determined by conducting 3-day tube counts at the four existing project driveways (one on Clairemont Mesa Boulevard, two on Ruffin Road and one on Ruffin Court). During discussions with the County, it was determined that as of January 2012, there were 300 employees at the project site. An additional 60 employees of the San Diego County DPW Development review groups (DPLU) and a training facility for around 50 trainees moved out of the building between June 2011 and January 2012.

The existing site generated traffic which was deducted from the total project traffic is the existing counted traffic plus the traffic generated by the 110 employees / trainees.

Table 6-1 summarizes the average daily and peak hour volumes currently generated by the site. Using the data in *Table 6-1*, the current trip generation rate per employee was determined from the average of the three day counts and the 300 employees. This rate was applied to the 110 employees that were relocated in the six months prior to the traffic counts in January 2012.

Based on the actual counts, the site currently generates an average of 3,527 daily trips with 399 trips during the AM peak hour (335 inbound and 64 outbound) and 343 trips during the PM peak hour (67 inbound and 276 outbound). ***Appendix B-6*** contains the daily count sheets at the project driveways.

With the addition of the traffic related to the 110 employees / trainees that relocated in the six months prior to the traffic counts, the current trip generation at the site is considered to be 4,332 daily trips with 529 AM peak hour trips (452 inbound and 77 outbound) and 453 PM peak hour trips (82 inbound and 371 outbound) as shown in *Table 6-1*. This is the amount of traffic that is removed from the traffic generated by the proposed project and the remaining traffic is the net new traffic added to the street system.

Appendix B-6 also contains an email from the County regarding the number of employees at the County Annex building within six months of the traffic counts.

TABLE 6-1
EXISTING TRIP GENERATION
COUNTY OPERATIONS CENTER

Description	Quantity	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
				% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
		Rate [a]	Volume			In	Out	Total			In	Out	Total
Actual Counted Traffic (January 2012)	300 Employees	11.76/Employee	3,527			335	64	399			68	276	344
DPLU (Vacated in 2011) [b]	60 Employees	11.76/Employee	705	11%	84:16	67	13	80	10%	20:80	14	55	69
Training Facility (Vacated in 2011) [c]	50 Attendees	2/Attendee	100	50%	100:0	50	-	50	40%	0:100	-	40	40
Total Existing Trip Generation			**4,332**			**452**	**77**	**529**			**82**	**371**	**453**

Footnotes:
a. Trip rates based on actual three-day counts.
b. Trip rates derived on the basis of the actual existing counts are applied to the DPLU employees to estimate the trips generated by these 50 employees.
c. It is assumed that all trainees will arrive at the site in the AM peak hour and leave at the end of the day during the PM peak hour.

6.2 Project Trip Generation

Project trip generation was estimated using the City of San Diego Trip Generation Manual, May 2003. The City Trip Generation Manual contains both driveway trip rates and cumulative trip rates. *Driveway trips* were utilized to analyze the project driveways, adjacent intersections and segments and the *cumulative trips* were utilized to analyze the off-site locations.

The following daily trip rates were used:

- Hospital: 20 trips per bed (driveway and cumulative)
- HSB: 50 trips per ksf (driveway), 20 trips per ksf (cumulative)

Notes:

1. Hospital Support Building (HSB) is Medical Office Building (MOB)
2. The location of the members' place of residence / work has no bearing on the trip rates listed above since these are standard rates provided by the City.

Even though the City of San Diego *Trip Generation Manual*, May 2003 allows using a rate of 16 daily cumulative trips per 1,000 SF if the MOB is greater than 100,000 SF, this lower cumulative trip rate was not used for analysis in this study especially since Phase 1 only plans to include 75,000 SF of Medical Office Building. The rate of 20 daily cumulative trips was used to estimate the total trips generated by the 180,000 SF MOB (*Table 6-2*).

Table 6-2 depicts the project trip generation. As seen in *Table 6-2*, the project is estimated to generate trips as summarized below:

PHASE I - PROJECT OPENING DAY YEAR 2017

Driveway Trips - Phase I of the project consists of a 321-bed hospital building and a 75 KSF Medical Office Building (MOB). Thus, in Phase I, the project is estimated to generate 10,170 daily *driveway* trips with 803 trips during the AM peak hour (585 inbound / 218 outbound) and 1,017 trips during the PM peak hour (306 inbound / 711 outbound).

Cumulative Trips - Project Phase I is estimated to generate a total of 7,920 daily *Cumulative* trips with 668 trips during the AM peak hour (477 inbound / 191 outbound) and 792 trips during the PM peak hour (238 inbound / 554 outbound).

Existing Site Generated Trips – as explained above, 24-hour traffic counts were conducted at each of the four driveways at the existing site to determine the current trips generated by the existing use (County Annex). These trips were deducted to determine the net additional trips to the street system. The existing land uses on the project site are estimated to generate a total of 4,332 daily trips with 529 trips during the AM peak hour (452 inbound / 77 outbound) and 453 trips during the PM peak hour (82 inbound / 371 outbound).

Net New Trips - Thus the Phase I project is estimated to generate a net 3,588 daily (*Cumulative*) trips with 139 trips during the AM peak hour (25 inbound / 114 outbound) and 339 trips during the PM peak hour (156 inbound / 183 outbound).

TABLE 6-2
TRIP GENERATION SUMMARY

Land Use	Quantity		Daily Trip Ends (ADT)			AM Peak Hour					PM Peak Hour				
						% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume[b]		
			Rate [a]		Volume			In	Out	Total			In	Out	Total
Kaiser Permanente Hospital - Phase I															
Hospital	321	Beds	20	/Bed	6,420	9%	70:30	405	173	578	10%	30:70	193	449	642
Medical Offices															
Driveway Trips	75	KSF	50	/KSF	3,750	6%	80:20	180	45	225	10%	30:70	113	262	375
Cumulative Trips	75	KSF	20	/KSF [c]	1,500	6%	80:20	72	18	90	10%	30:70	45	105	150
Project Phase I															
Driveway Trips					**10,170**			**585**	**218**	**803**			**306**	**711**	**1,017**
Cumulative Trips (New Trips)					**7,920**			**477**	**191**	**668**			**238**	**554**	**792**
(Less) Existing Site Trip Generation (June '11)					(4,332)			(452)	(77)	(529)			(82)	(371)	(453)
Net Trips (Cumulative Rates) - Project Phase I					**3,588**			**25**	**114**	**139**			**156**	**183**	**339**
Kaiser Permanente Hospital - Phase II															
Hospital	129	Beds	20	/Bed	2,580	9%	70:30	162	70	232	10%	30:70	77	181	258
Medical Offices															
Driveway Trips	105	KSF	50	/KSF	5,250	6%	80:20	252	63	315	10%	30:70	158	367	525
Cumulative Trips	105	KSF	20	/KSF [c]	2,100	6%	80:20	101	25	126	10%	30:70	63	147	210
Phase II															
Driveway Trips					**7,830**			**414**	**133**	**547**			**235**	**548**	**783**
Cumulative Trips (New Trips)					**4,680**			**263**	**95**	**358**			**140**	**328**	**468**
Entire Project															
Driveway Trips					**18,000**			**999**	**351**	**1,350**			**541**	**1,259**	**1,800**
Cumulative Trips (New Trips)					**12,600**			**740**	**286**	**1,026**			**378**	**882**	**1,260**
(Less) Existing Site Trip Generation (June '11)					(4,332)			(452)	(77)	(529)			(82)	(371)	(453)
Net Trips (Cumulative Rates) - Entire Project					**8,268**			**288**	**209**	**497**			**296**	**511**	**807**

Footnotes:

a. Trip rates from *Trip Generation Manual*, City of San Diego, May 2003.
b. KSF - 1,000 Square Feet.
c. Daily cumulative trip rate is 20 per KSF for MOB.

PROJECT PHASE II

Project Phase II includes adding 129 hospital beds and 105 KSF of MOB. The additional trips generated by the Phase II development are as follows.

Driveway Trips - In Phase II, 105 KSF will be added to the MOB. Thus, the Phase II Project is estimated to generate 7,830 daily *driveway* trips with 547 trips during the AM peak hour (414 inbound / 133 outbound) and 783 trips during the PM peak hour (235 inbound / 548 outbound).

Cumulative Trips –Phase II of the project is estimated to generate 4,680 daily *Cumulative* trips with 358 trips during the AM peak hour (263 inbound / 95 outbound) and 468 trips during the PM peak hour (140 inbound / 328 outbound).

ENTIRE PROJECT – OPENING DAY YEAR 2030

Driveway Trips - The Entire Project is estimated to generate a total of 18,000 daily *driveway* trips with 1,350 trips during the AM peak hour (999 inbound / 351 outbound) and 1,800 trips during the PM peak hour (540 inbound / 1,260 outbound).

Cumulative Trips – The Entire Project is estimated to generate a total of 12,600 daily *Cumulative* trips with 1,026 trips during the AM peak hour (740 inbound / 286 outbound) and 1,260 trips during the PM peak hour (378 inbound / 882 outbound).

Existing Site Generated Trips – As explained in Phase I above, the project site is currently occupied by San Diego County DPW and generates 4,322 daily trips with 529 AM peak hour trips (452 inbound and 77 outbound) and 453 PM peak hour trips (82 inbound and 371 outbound). These trips were deducted from the total cumulative project trips to obtain the net *cumulative* trips.

Net New Trips – Thus, after deducting the existing trips as in Phase I, the entire project is estimated to add a net 8,268 daily (*Cumulative*) trips with 497 trips (288 inbound / 209 outbound) during the AM peak hour and 807 trips (296 inbound / 511 outbound) during the PM peak hour.

6.3 Trip Distribution

Various methodologies are available to determine the project trip distribution. A Select Zone Analysis (SZA) is the most common methodology to estimate the project trip distribution. However, for this project actual zip code information of members was available from the client. This is a more accurate way of determining the origins of trips by members. The Members' zip code information obtained from the client was plotted on a regional Zip Code map. Employees will also be a source of trip generation at the site. The distribution of employee traffic was based on the location of residential areas in San Diego, focusing on areas closer to the site. Based on the membership Zip code distribution and the assumed employee distribution, a regional trip distribution was developed. It was determined, in general, that 12% of the project traffic is oriented to the north, 70% to the south, 11% to the west and 5% to the east, in general. The remaining 2% is estimated to be local traffic.

Figure 6-1 depicts the membership numbers by Zip code. ***Figure 6-2*** depicts the project traffic distribution.

6.4 Trip Assignment

The trips were assigned by phase using the trip distribution percentages in *Figure 7-2*. The total driveway trips were assigned at all project driveways and the Clairemont Mesa Boulevard / Ruffin Road and Ruffin Court / Ruffin Road intersections which are adjacent to the project site. Cumulative trips were assigned at the remaining study area intersections.

Figure 6-3 depicts Project Phase I assignment, while ***Figure 6-4*** depicts the assignment of the entire project. ***Figure 6-5*** depicts the Existing + Project Phase I traffic volumes and ***Figure 6-6*** depicts the Existing + Entire Project traffic volumes.

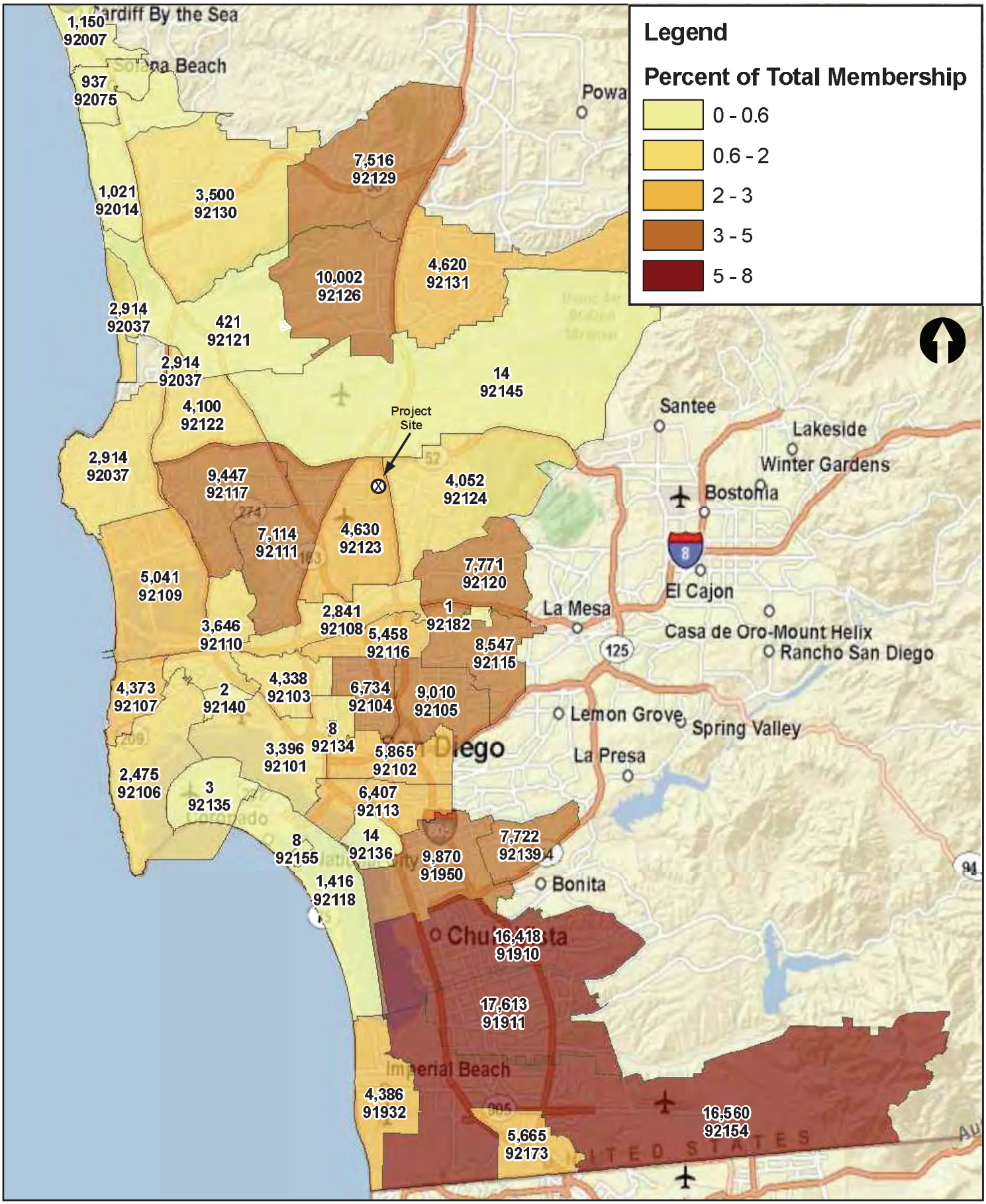


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Figure 6-1

Membership by Zip Code

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

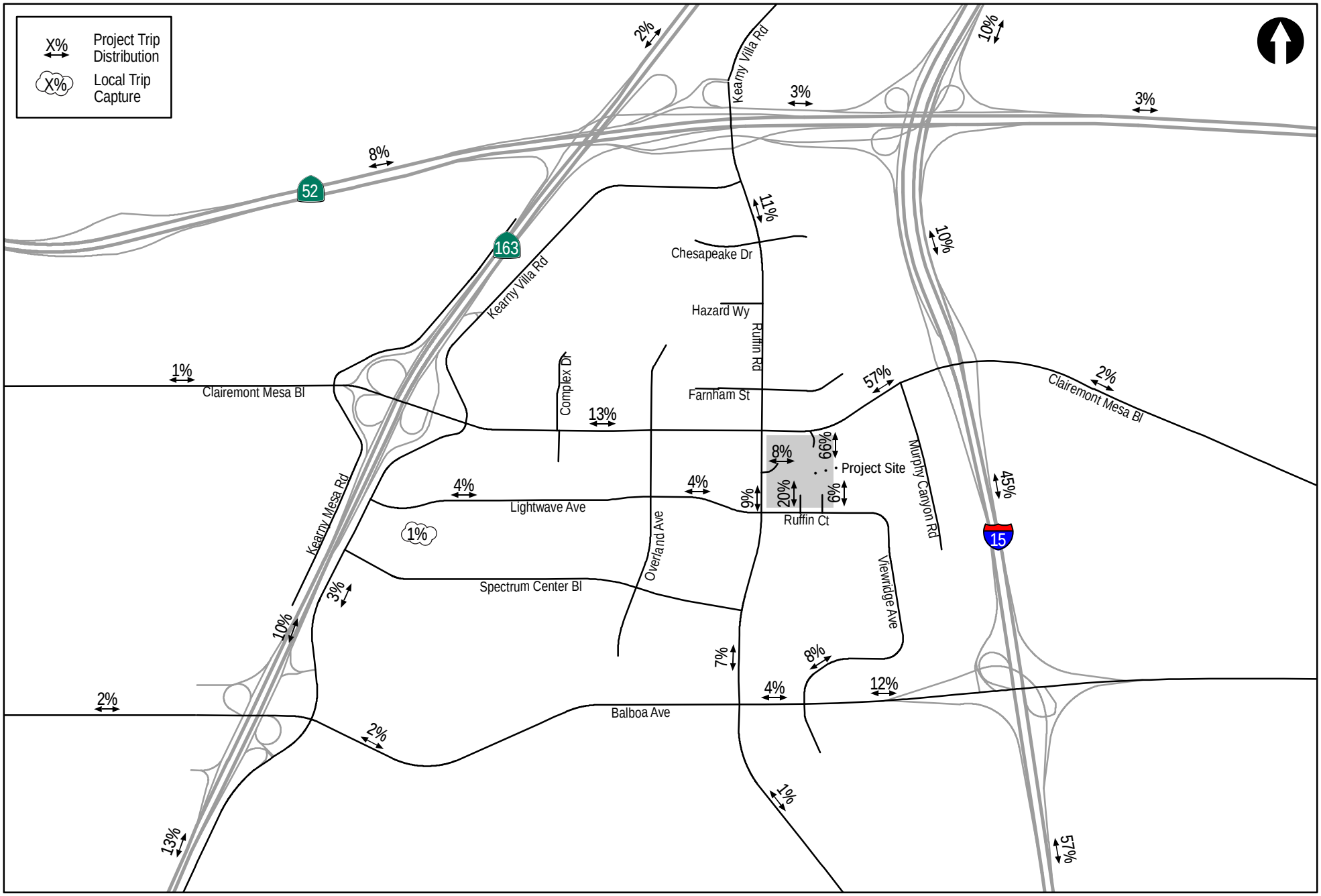

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Figure 6-2

Project Trip Distribution

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

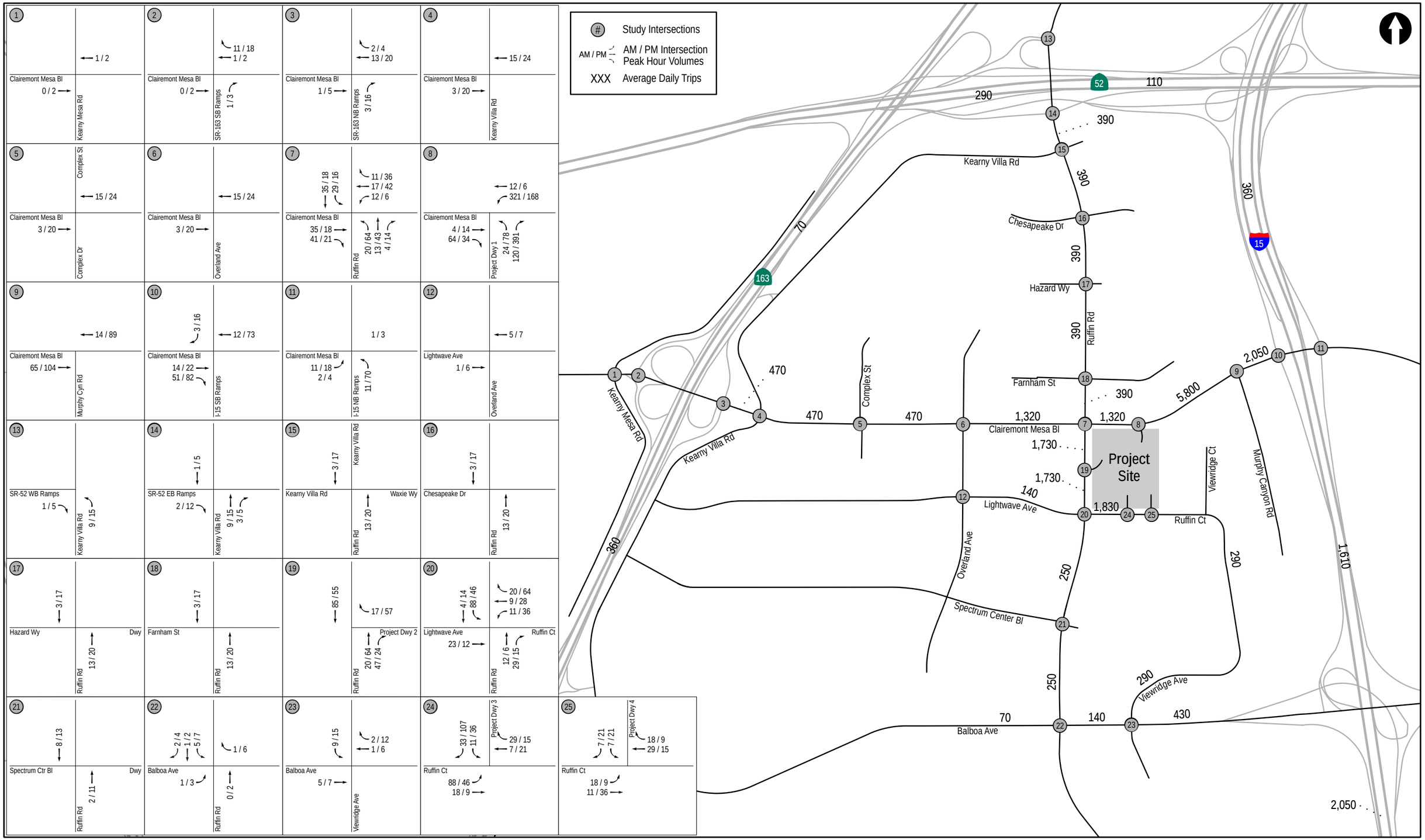

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Figure 6-3

Project Phase I Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

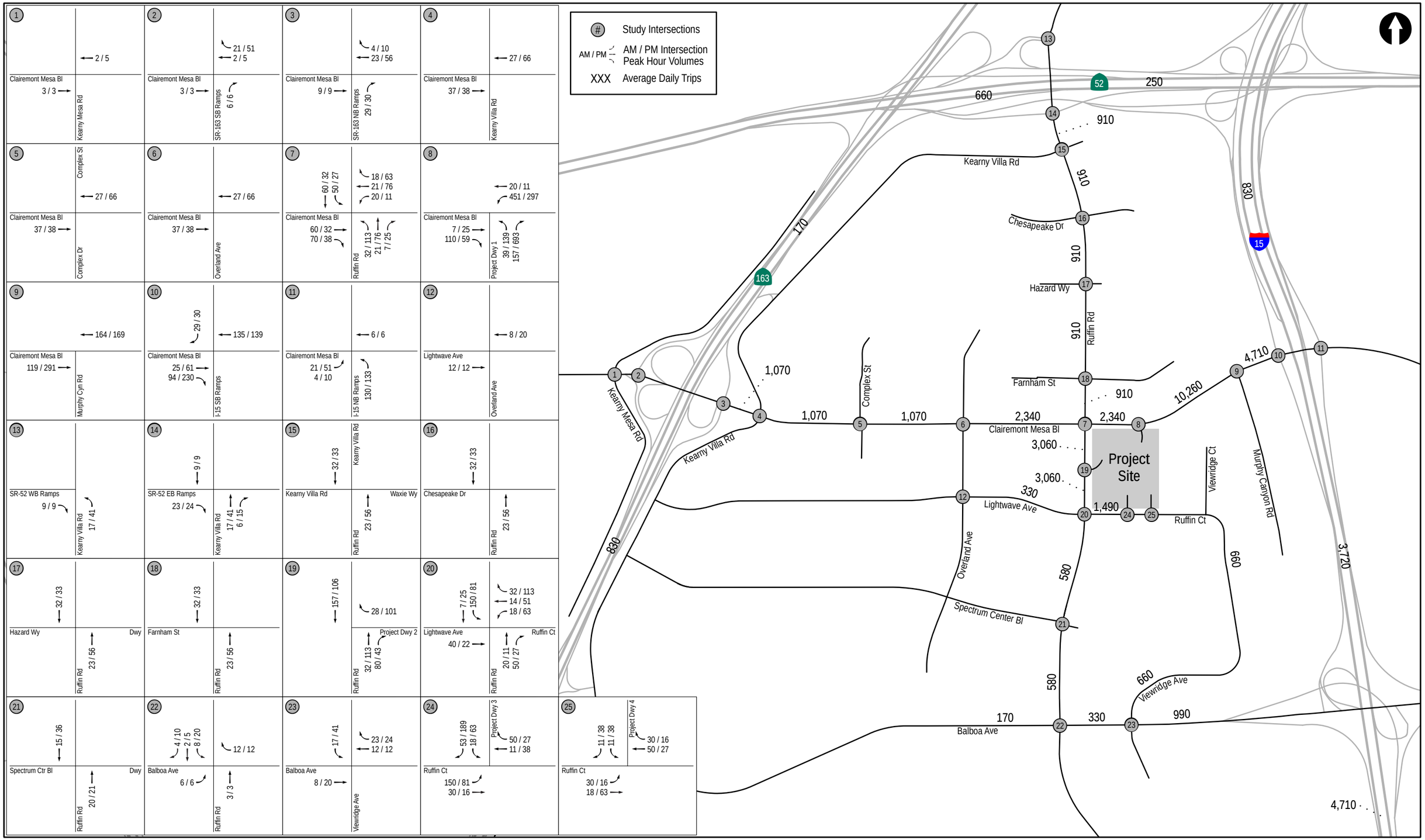

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Figure 6-4

Entire Project Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

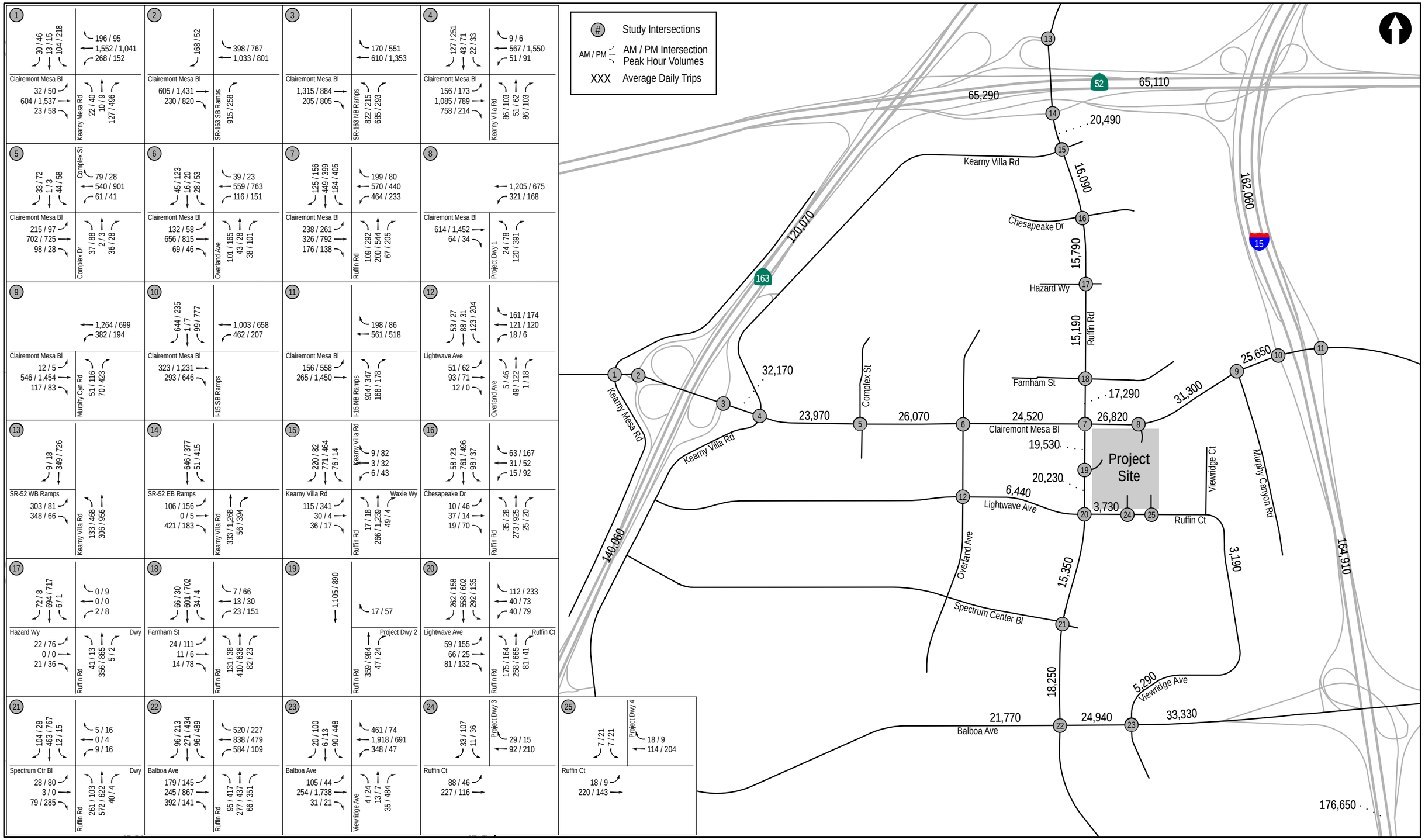

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Figure 6-5

Existing + Project Phase I Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

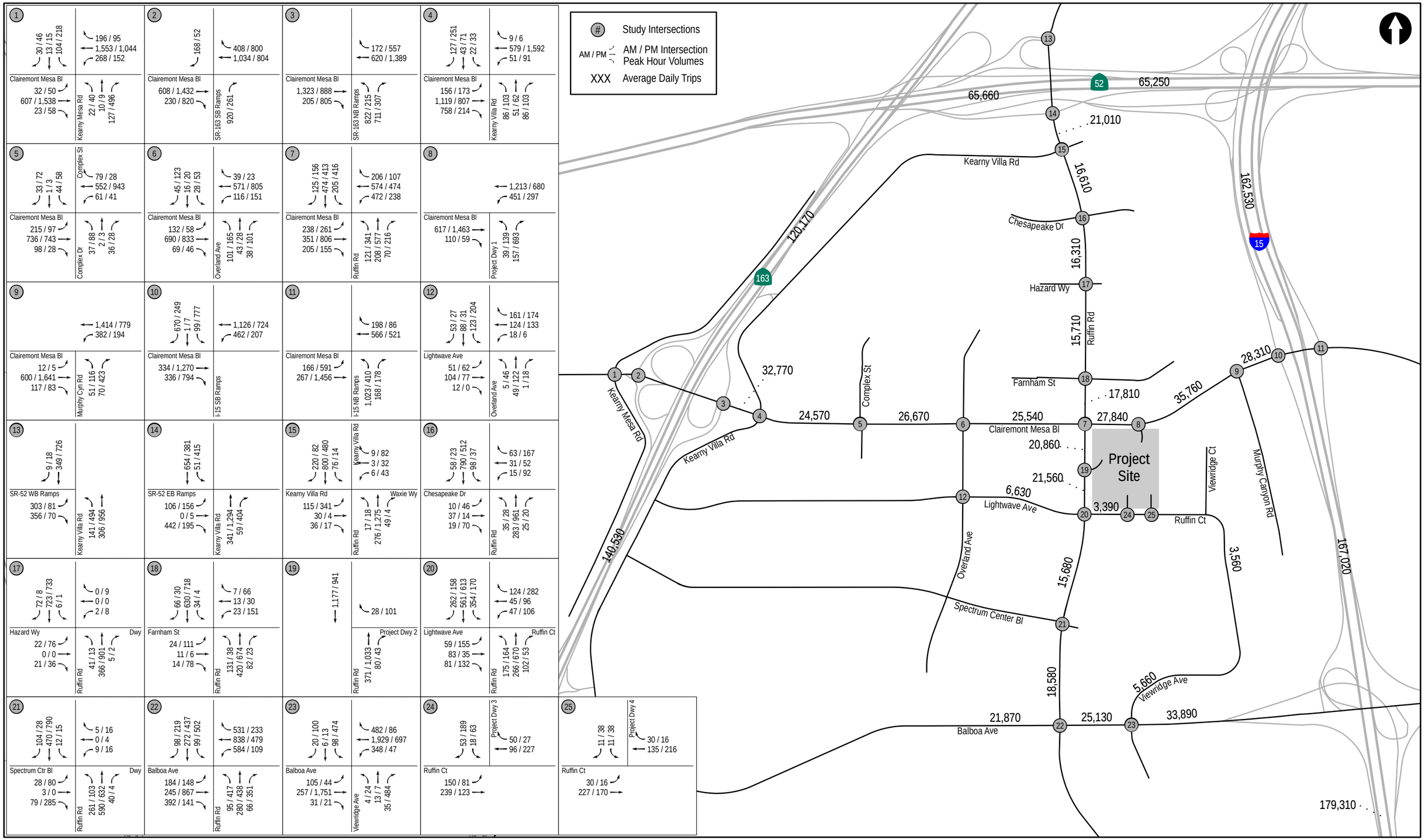

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Figure 6-6

Existing + Entire Project Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

7.0 CUMULATIVE PROJECTS

Several planned projects in the project vicinity were reviewed, are reasonably foreseeable, and are expected to be built and occupied prior to the project's opening day in 2017. Hence, they are included in the near-term analysis. Projects that are completed and occupied are not included if they were occupied at the time the counts were conducted (January 2012). Also, for projects that are partially completed and occupied, the portion of those projects that are yet to be completed are also included. The traffic expected to be generated by these projects was assigned to the project study area intersections and segments.

Table 7-1 lists the cumulative projects in the project vicinity and the total ADT generated by these projects.

SPECTRUM PROJECT

It may be noted that 72% of the Spectrum Project was constructed at the time the traffic counts were conducted (January 2012) and therefore only 28% of the traffic related to that project was included in the cumulative analysis. The remaining development at the Spectrum Center will add 13,320 ADT as summarized in *Table 7-1*. However, for a conservative analysis, since 72% is constructed, 28% or 25680 additional ADT is assumed in the cumulative projects analysis for the Spectrum Project.

SAN DIEGO OPERATIONS CENTER

Approximately 55% of the project was occupied at the time the traffic counts were conducted. For a conservative analysis 50% of the project traffic was included in the cumulative analysis.

STONE CREEK

The project is estimated to generate a total of 47,516 ADT at the build out of Stone Creek. In 2017 it is estimated that this project will generate approximately 2,475 ADT as shown in *Table 7-1*. Since this project is located more than 5 miles from the project site, the traffic from this project at the study area intersections will be minimal.

Figure 7-1 is the Cumulative projects location map. ***Figure 7-2*** depicts the Cumulative projects traffic assignment, while ***Figure 7-3*** depicts the Near-Term traffic volumes. ***Figure 7-4*** depicts the Near-Term + Entire Project traffic volumes.

TABLE 7-1
SUMMARY OF CUMULATIVE PROJECTS ADT

Project Name	Land Use Type	Size		Daily Trips	Status
1. Spectrum Center [a]	Residential	1,568	DU	91,720	72% Constructed
	Commercial	3,689,000	SF		
	Industrial	360,000	SF		
Grand Total Spectrum Center				*91,720*	
Remaining to be built	Apartments	756	DU	4,536	
	Office	475,000	SF	5,843	
Others	Office	200,000	SF	2,851	
Total Spectrum to be built				**13,230**	
2. Medical Examiner	-	-		108	Approved
3. Kyocera	Office	104,000	SF	1,499	In Review
4. SD County Operations Center [b]	Office	874,000	SF	23,761	55% Occupied
5. Stone Creek					
Year 2017	**Light Industrial Park**	**165,000**	**SF**	**2,475**	In Review
Project Buildout	Business Park	135,000	SF	2,009	
	High Tech Park	300,000	SF	4,560	
	Residential	4,445	SF	24,140	
	Retail	174000	Acres	6681	
	Commercial Office	200,000	SF	2,682	
	Hotel	175	Rooms	1,400	
	Neighborhood Park	26.2	Acres	131	
Subtotal Stone Creek				**47,516**	

Footnote:

a. Approximately 72% of the project traffic is included in the existing traffic counts therefore, only 28% of this traffic (25,700 ADT) is included in the cumulative analysis. Conversation with Sunroad indicated that project to be built will generate approximately 10,000 ADT. Therefore the cumulative analysis is conservative.

b. Approximately 55% of the County Operations Center traffic was already built at the time the existing traffic count data was collected. Therefore, a conservative 50% of the project trip generation is added as cumulative traffic.

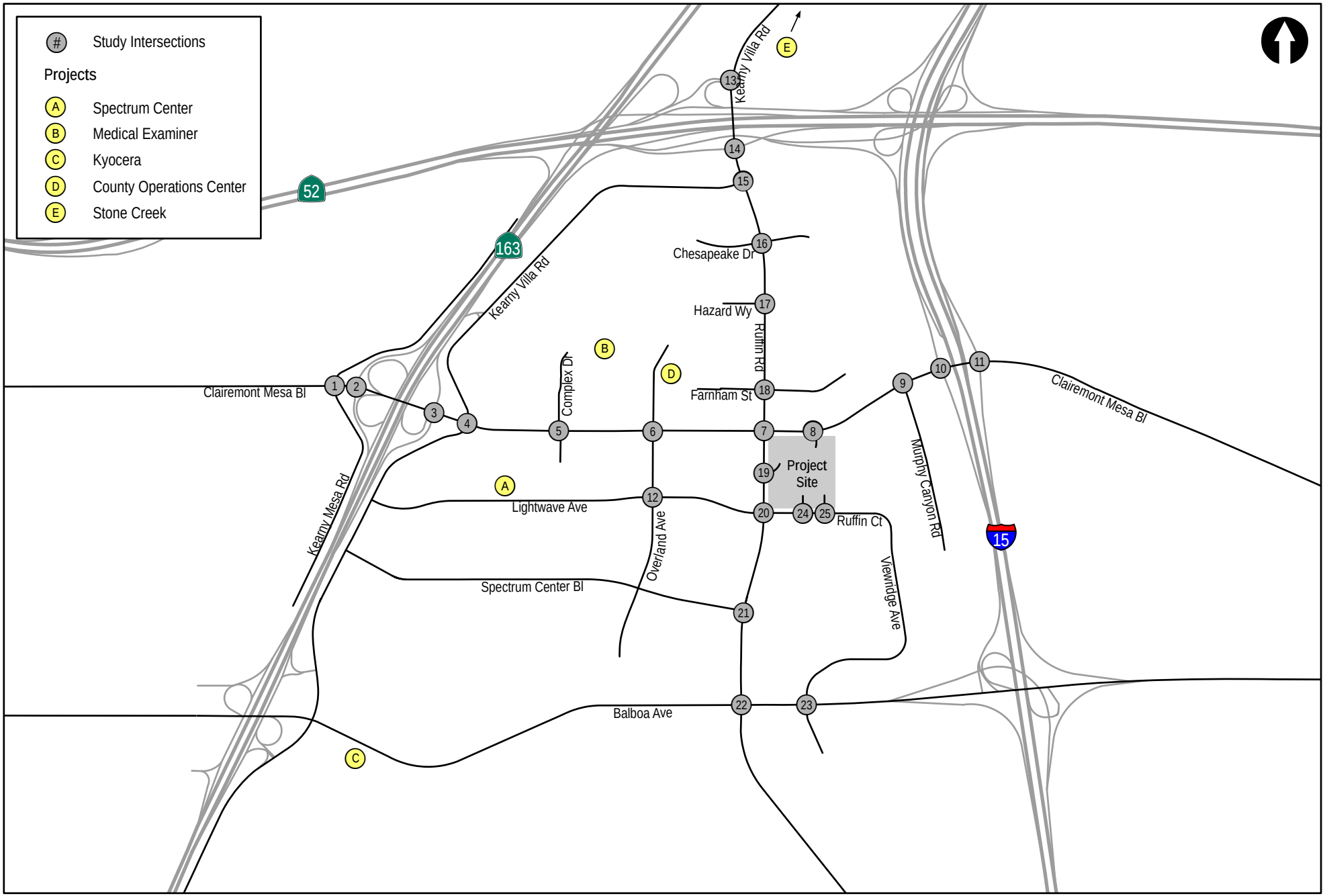

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Figure 7-1

Cumulative Projects Location Map

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

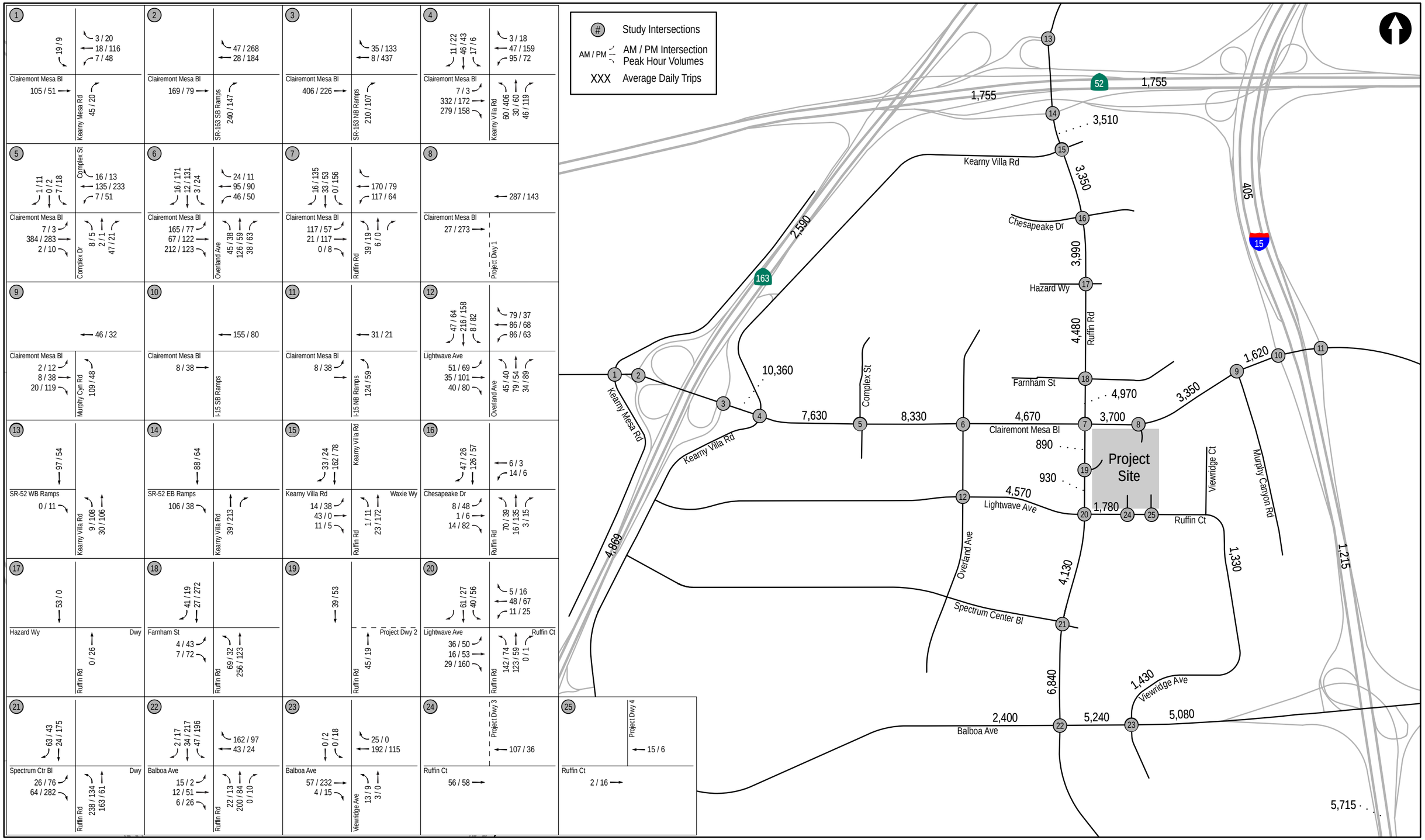

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Figure 7-2

Cumulative Projects Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

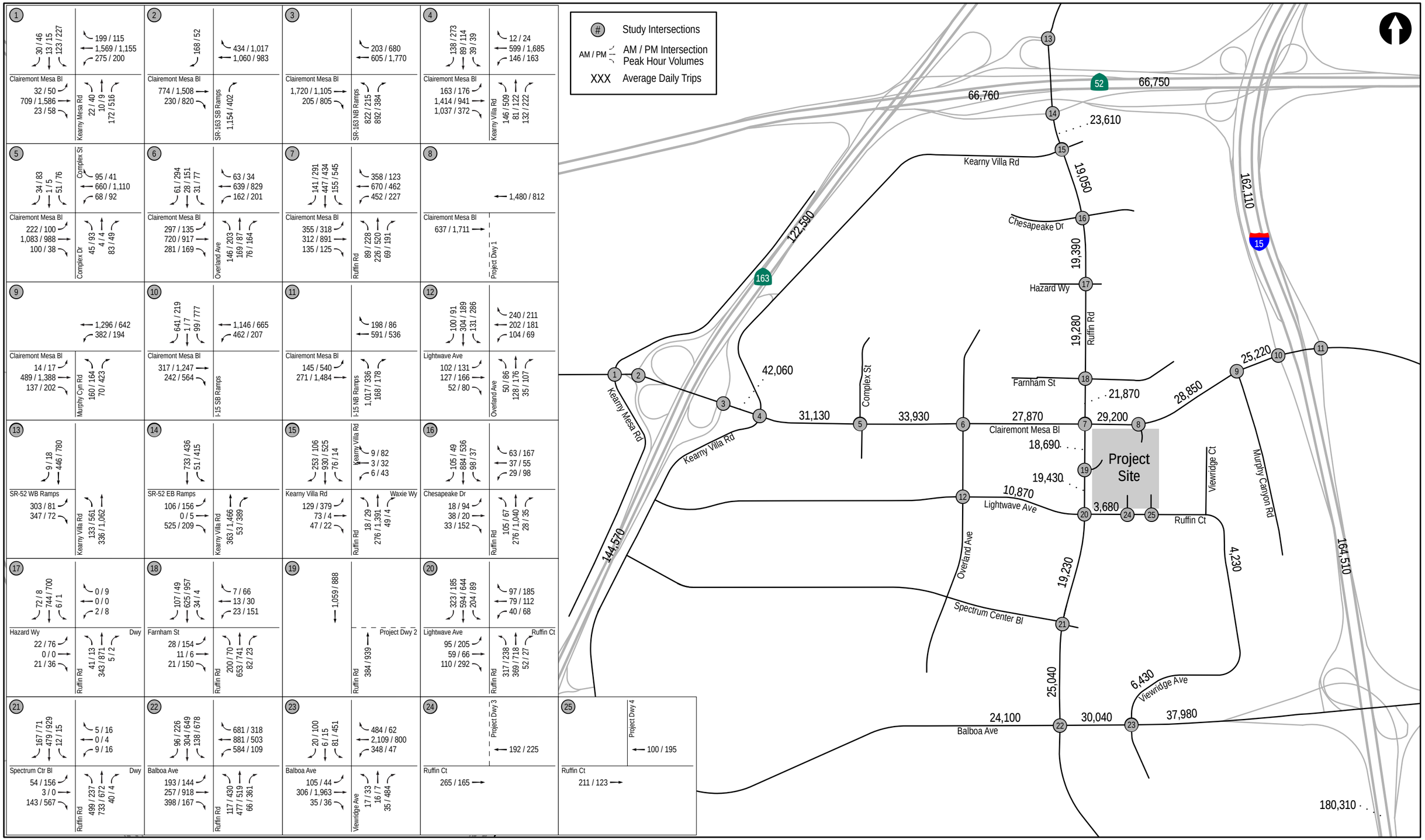

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Figure 7-3

Existing + Cumulative Projects Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

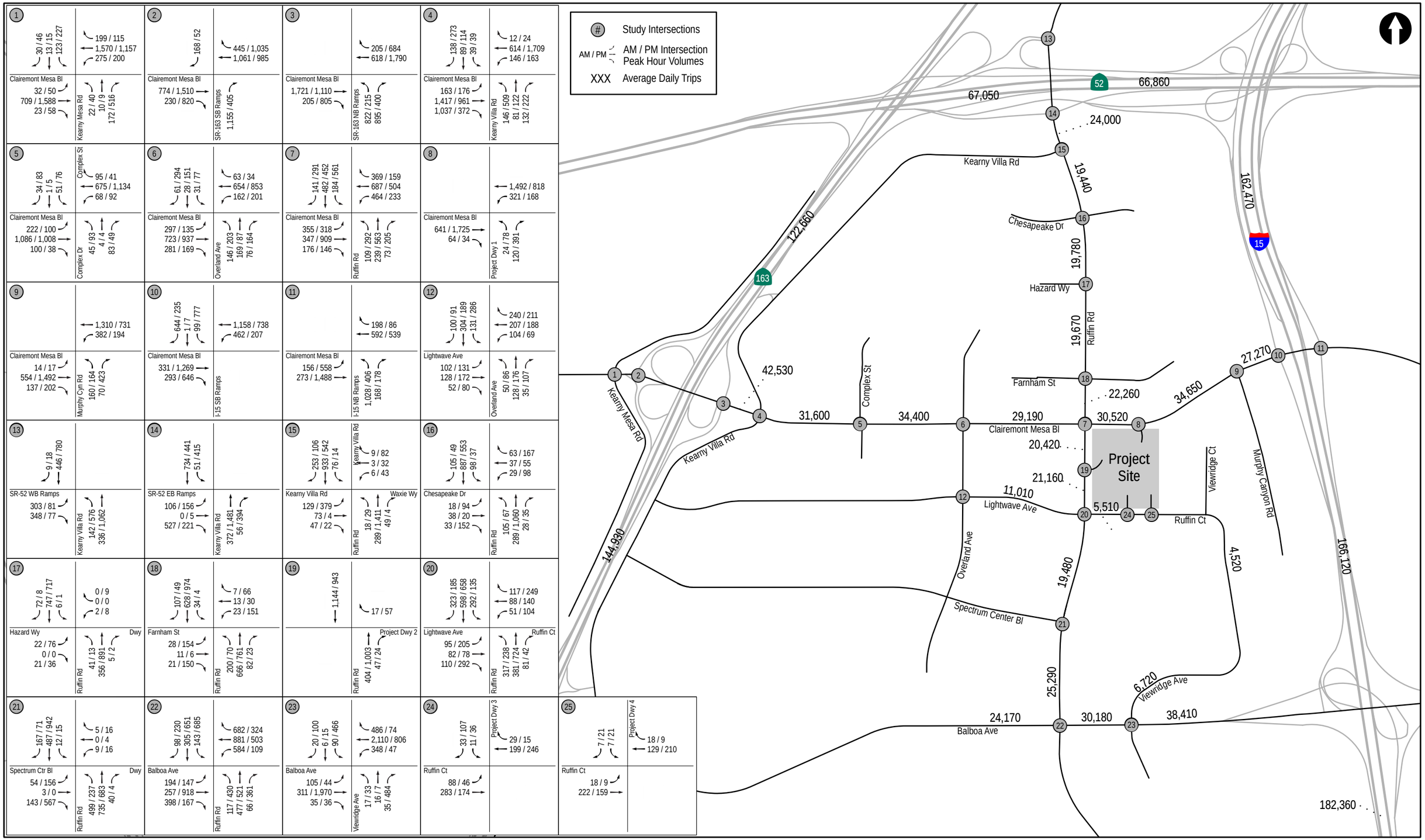

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Figure 7-4

Existing + Cumulative Projects + Project Phase I Traffic Volumes

KAISER KEARNY MESA

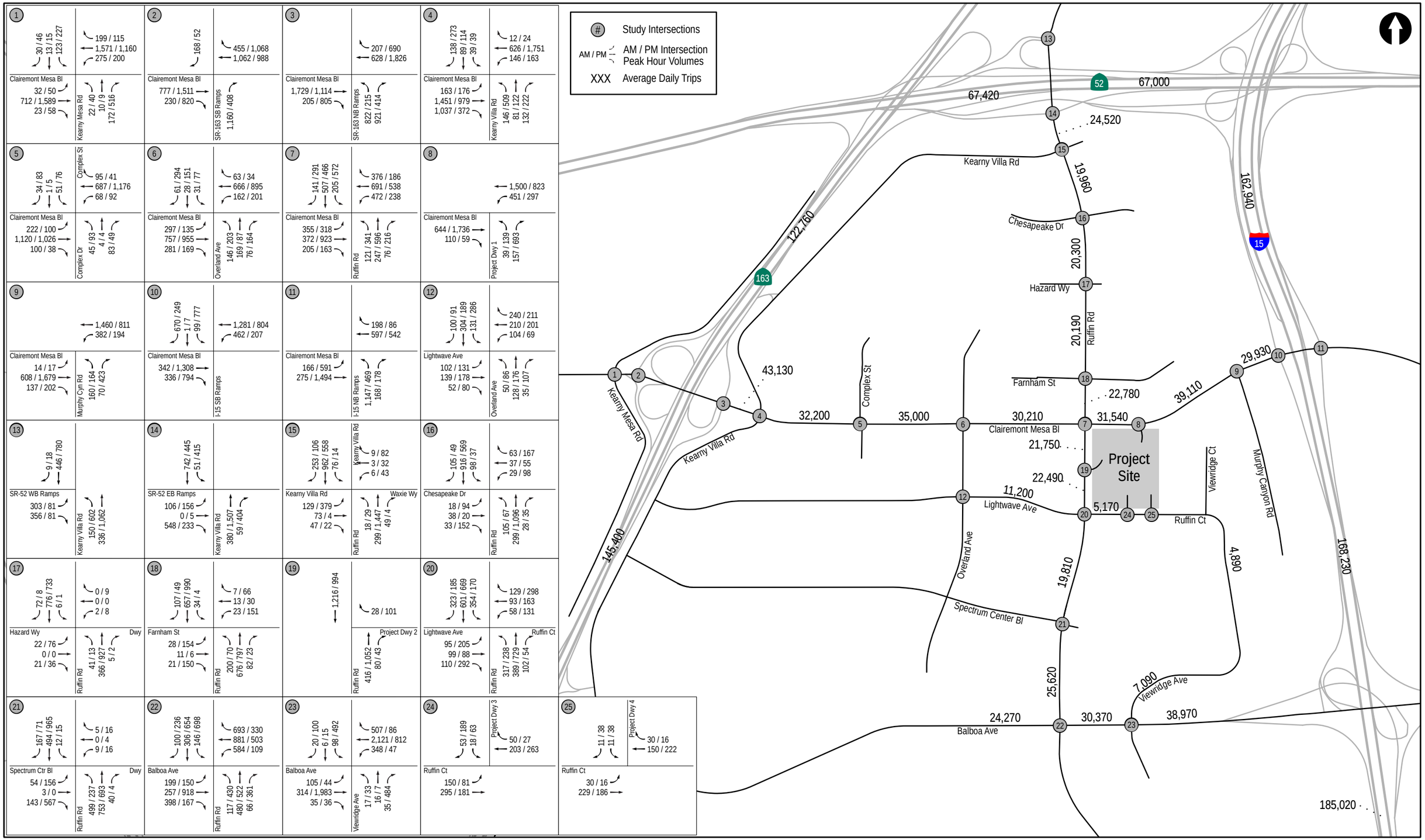

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Figure 7-5

Existing + Cumulative Projects + Entire Project Traffic Volumes

Kaiser San Diego Central Medical Center

8.0 ANALYSIS OF EXISTING PLUS PROJECT SCENARIO

8.1 Existing + Project Phase I

8.1.1 *Intersection Analysis*

Table 8-1 summarizes the Existing + Project Phase I peak hour intersection operations. As seen in *Table 8-1*, with the addition of the Project Phase I traffic, all study area intersections are calculated to continue to operate at LOS D or better.

The Existing + Project Phase I peak hour analysis worksheets are included in ***Appendix D.***

8.1.2 *Segment Operations*

Table 8-2 summarizes the Existing + Project Phase I segment operations. As seen in *Table 8-2*, with the addition of the Project Phase I traffic, all segments within the study area are calculated to operate at LOS D or better.

8.1.3 *Freeway Mainline Analysis*

Table 8-3 summarizes the Existing + Project Phase I freeway mainline operations. As seen in *Table 8-3*, with the addition of the Project Phase I traffic, all study area freeway segments are calculated to operate at LOS D or better except one. The segment of SR 52 between Kearny Villa Road and I-15 is calculated to continue to operate at LOS E in the WB direction. The project has no significant impact since the increase in V/C ratio due to the project traffic is less than 0.005, the allowable increase.

8.1.4 *Freeway Ramp Meter Analysis*

Table 8-4 summarizes the Existing + Project Phase I ramp meter operations. As seen in *Table 8-4*, using the most restrictive discharge rates obtained from Caltrans, all HOV lanes operate with no delay or queues with the addition of the Project Phase I traffic. However, the SOV lanes at the following ramps are calculated to have delays of 15 minutes or more:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 21 minutes with an 84-vehicle, or a 2,100-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Delay of 24 minutes with a 154-vehicle, or a 3,858-foot long queue.

Comparing the calculated values to the maximum observed existing values, with the addition of Project Phase I traffic, the proportionate delays and queues are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 1 minute with a 8-vehicle, or a 200-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Queue: Delay of 7 minutes with a 49-vehicle, or a 1,225-foot long queue.

As seen above, the resulting delays and queues due to the addition of Project Phase I traffic are within acceptable limits (less than 15 minutes).

TABLE 8-1
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project Phase I		Δ [c] Delay	Impact Type	Existing + Entire Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
1. Clairemont Mesa Blvd / Kearny Mesa Rd	Signal	AM	17.0	B	17.1	B	0.1	None	17.4	B	0.3	None
		PM	28.5	C	28.8	C	0.3	None	29.6	C	0.8	None
2. Clairemont Mesa Blvd / SR 163 SB Ramps	MSSC [d]	AM	13.4	B	13.5	B	0.1	None	13.6	B	0.1	None
		PM	11.6	B	11.7	B	0.1	None	11.7	B	0.0	None
3. Clairemont Mesa Blvd / SR 163 NB Ramps	Signal	AM	19.7	B	20.0	C	0.3	None	23.4	C	3.4	None
		PM	12.5	B	13.4	B	0.9	None	22.4	C	9.0	None
4. Clairemont Mesa Blvd / Kearny Villa Rd [e]	Signal	AM	17.1	B	17.1	B	0.0	None	17.3	B	0.2	None
		PM	18.7	B	19.1	B	0.4	None	20.0	C	0.9	None
5. Clairemont Mesa Blvd / Complex Dr [e]	Signal	AM	15.1	B	15.1	B	0.0	None	18.1	B	3.0	None
		PM	15.6	B	16.6	B	1.0	None	18.0	B	1.4	None
6. Clairemont Mesa Blvd / Overland Ave [e]	Signal	AM	29.3	C	29.3	C	0.0	None	39.8	D	10.5	None
		PM	30.8	C	33.1	C	2.3	None	46.8	D	13.7	None
7. Clairemont Mesa Blvd / Ruffin Rd [e]	Signal	AM	33.5	C	36.8	D	3.3	None	48.4	D	11.6	None
		PM	40.6	D	41.7	D	1.1	None	50.9	D	9.2	None
8. Clairemont Mesa Blvd / Project Access Dwy [f]	Signal	AM	DNE	DNE	9.9	A	NA	None	15.5	B	NA	None
		PM	DNE	DNE	14.5	B	NA	None	25.7	C	NA	None
9. Clairemont Mesa Blvd / Murphy Canyon Rd [e]	Signal	AM	12.1	B	13.9	B	1.8	None	14.6	B	0.7	None
		PM	21.5	C	22.6	C	1.1	None	28.5	C	5.9	None
10. Clairemont Mesa Blvd / I-15 SB Ramps	Signal	AM	23.6	C	23.7	C	0.1	None	25.3	C	1.6	None
		PM	22.9	C	23.0	C	0.1	None	24.1	C	1.1	None

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TABLE 8–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project Phase I		Δ Delay	Impact Type	Existing + Entire Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
11. Clairemont Mesa Blvd / I-15 SB Ramps	Signal	AM	23.6	C	23.9	C	0.3	None	25.2	C	1.3	None
		PM	14.7	B	15.2	B	0.5	None	20.6	C	5.4	None
12. Lightwave Ave / Overland Ave	Signal	AM	15.9	B	15.9	B	0.0	None	15.9	B	0.0	None
		PM	19.0	B	19.3	B	0.3	None	19.4	B	0.1	None
13. Ruffin Rd / SR 52 WB Ramps	Signal	AM	20.7	C	20.8	C	0.1	None	21.7	C	0.9	None
		PM	14.3	B	14.6	B	0.3	None	19.2	B	4.6	None
14. Ruffin Rd / SR 52 EB Ramps	Signal	AM	14.4	B	14.4	B	0.0	None	15.3	B	0.9	None
		PM	42.0	D	43.6	D	1.6	None	48.4	D	4.8	None
15. Ruffin Rd / Kearny Villa Rd	Signal	AM	12.9	B	13.3	B	0.4	None	13.3	B	0.0	None
		PM	17.5	B	20.3	C	2.8	None	26.1	C	5.8	None
16. Ruffin Rd / Chesapeake Dr	Signal	AM	10.1	B	10.1	B	0.0	None	10.1	B	0.0	None
		PM	12.9	B	13.7	B	0.8	None	14.4	B	0.7	None
17. Ruffin Rd / Hazard Wy	Signal	AM	9.1	A	9.3	A	0.2	None	9.4	A	0.1	None
		PM	11.0	B	11.0	B	0.0	None	11.2	B	0.2	None
18. Ruffin Rd / Farnham St	Signal	AM	8.5	A	8.5	A	0.0	None	8.5	A	0.0	None
		PM	12.6	B	12.6	B	0.0	None	12.7	B	0.1	None
19. Ruffin Rd / Project Access Dwy [f]	MSSC	AM	DNE	DNE	9.5	A	NA	None	9.6	A	NA	None
		PM	DNE	DNE	9.5	A	NA	None	9.8	A	NA	None
20. Ruffin Rd / Ruffin Ct	Signal	AM	18.7	B	20.6	C	1.9	None	21.8	C	1.2	None
		PM	22.0	C	27.7	C	5.7	None	30.8	C	3.1	None

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TABLE 8–1 (CONTINUED)
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project Phase I		Δ Delay	Impact Type	Existing + Entire Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
21. Ruffin Rd / Spectrum Center Blvd	Signal	AM	13.0	B	13.1	B	0.1	None	13.3	B	0.2	None
		PM	17.8	B	17.8	B	0.0	None	17.9	B	0.1	None
22. Ruffin Rd / Balboa Ave	Signal	AM	45.9	D	47.4	D	1.5	None	47.8	D	1.9	None
		PM	38.5	D	40.4	D	1.9	None	41.6	D	1.2	None
23. Viewridge Ave / Balboa Ave	Signal	AM	16.1	B	16.6	B	0.5	None	19.4	B	2.8	None
		PM	33.5	C	34.5	C	1.0	None	36.6	D	2.1	None
24. Ruffin Ct / Project Dwy #3 [f]	MSSC	AM	DNE	DNE	10.2	B	NA	None	11.3	B	NA	None
		PM	DNE	DNE	10.7	B	NA	None	14.3	B	NA	None
25. Ruffin Ct / Project Dwy #4 [f]	MSSC	AM	DNE	DNE	10.1	B	NA	None	10.6	B	NA	None
		PM	DNE	DNE	10.6	B	NA	None	11.3	B	NA	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to project traffic.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn / approach delay and LOS are reported.
e. These intersections are part of a coordinated signal system
f. The project driveways are only analyzed in the "with Project" scenarios.

General Note:

DNE – Does not exist
NA – Not Applicable

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 8–2
EXISTING + PROJECT STREET SEGMENT OPERATIONS

Street Segment	Existing Functional Classification	Capacity (LOS E) [a]	Existing			Existing + Project Phase I			Δ V/C	Impact Type	Existing + Entire Project			Δ V/C	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C			ADT	LOS	V/C		
Clairemont Mesa Boulevard															
SR 163 NB Ramps to Kearny Villa Rd	6-lane Prime	60,000	31,700	B	0.528	32,170	B	0.536	0.008	None	32,770	B	0.546	0.018	None
Kearny Villa Rd to Complex Dr	6-lane Major	50,000	23,500	B	0.470	23,970	B	0.479	0.009	None	24,570	B	0.491	0.021	None
Kearny Villa Rd to Overland Ave	6-lane Major	50,000	25,600	B	0.512	26,070	B	0.521	0.009	None	26,670	B	0.533	0.021	None
Overland Ave to Ruffin Rd	6-lane Major	50,000	23,200	B	0.464	24,520	B	0.490	0.026	None	25,540	B	0.511	0.047	None
Ruffin Rd to Project Access Dwy	5-lane Major	45,000	25,500	C	0.567	26,820	C	0.596	0.029	None	27,840	C	0.619	0.053	None
Proj Access Dwy to Murphy Cnyn Rd	5-lane Major	45,000	25,500	C	0.567	31,300	C	0.696	0.129	None	35,760	D	0.795	0.229	None
Murphy Canyon Rd to I-15	6-lane Major	50,000	23,600	B	0.472	25,650	B	0.513	0.041	None	28,310	C	0.566	0.094	None
Lightwave Avenue															
Overland Ave to Ruffin Rd	4-Lane Col	30,000	6,300	A	0.210	6,440	A	0.215	0.005	None	6,630	A	0.221	0.011	None
Ruffin Court															
Ruffin Rd to Project Dwy	2-Lane Col	15,000	1,900	A	0.127	3,730	A	0.249	0.122	None	3,390	A	0.226	0.099	None
Balboa Avenue															
Ponderosa Ave to Ruffin Rd	4-Lane Major	40,000	21,700	C	0.543	21,770	C	0.544	0.001	None	21,870	C	0.547	0.004	None
Ruffin Rd to Viewridge Ave	6-Lane Prime	60,000	24,800	A	0.413	24,940	A	0.416	0.003	None	25,130	B	0.419	0.006	None
Viewridge Ave to I-15	6-Lane Prime	60,000	32,900	B	0.548	33,330	B	0.556	0.008	None	33,890	B	0.565	0.017	None
Viewridge Avenue															
South of Ruffin Ct	2-Lane Col	15,000	2,900	A	0.193	3,190	A	0.213	0.019	None	3,560	A	0.237	0.044	None
North of Balboa Ave	2-Lane Col	15,000	5,000	A	0.333	5,290	B	0.353	0.019	None	5,660	B	0.377	0.044	None

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TABLE 8–2 (CONTINUED)
EXISTING + PROJECT STREET SEGMENT OPERATIONS

Street Segment	Existing Functional Classification	Capacity (LOS E) [a]	Existing			Existing + Project Phase I			Δ V/C	Impact Type	Existing + Entire Project			Δ V/C	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C			ADT	LOS	V/C		
Ruffin Road															
SR 52 to Kearny Villa Rd	4-Lane Major	40,000	20,100	B	0.503	20,490	B	0.512	0.010	None	21,010	C	0.525	0.023	None
Kearny Villa Rd to Chesapeake Dr	4-Lane Col	30,000	15,700	C	0.523	16,090	C	0.536	0.013	None	16,610	C	0.554	0.031	None
Chesapeake Dr to Hazard Wy	4-Lane Col	30,000	15,400	C	0.513	15,790	C	0.526	0.013	None	16,310	C	0.544	0.031	None
Hazard Wy to Farnham St	4-Lane Col	30,000	14,800	C	0.493	15,190	C	0.506	0.013	None	15,710	C	0.524	0.031	None
Farnham St to Clairemont Mesa Blvd	4-Lane Col	30,000	16,900	C	0.563	17,290	C	0.576	0.013	None	17,810	C	0.594	0.031	None
Clairemont Mesa Blvd to Project Dwy	4-Lane Col	30,000	17,800	C	0.593	19,530	C	0.651	0.058	None	20,860	D	0.695	0.102	None
Project Dwy to Ruffin Ct	4-Lane Col	30,000	18,500	C	0.617	20,230	D	0.674	0.057	None	21,560	D	0.719	0.102	None
Ruffin Crt to Spectrum Ctr Blvd	4-Lane Col	30,000	15,100	C	0.503	15,350	C	0.512	0.009	None	15,680	C	0.523	0.020	None
Spectrum Ctr Blvd to Balboa Ave	4-Lane Col	30,000	18,000	C	0.600	18,250	C	0.608	0.008	None	18,580	C	0.619	0.019	None

Footnotes:

a. Capacities based on City of San Diego Roadway Capacity Table.

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity.

TABLE 8-3
EXISTING + PROJECT PEAK HOUR FREEWAY MAINLINE OPERATIONS

EXISTING + PROJECT PHASE 1

Freeway Segment	Dir.	# of Lanes [a]	Hourly Cap [b]	Existing Peak Hour Volume [c]		Project Phase 1 Traffic [d]		Existing + Project Phase 1 Traffic		V/C		Δ V/C		LOS		Impact Type
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
Existing + Project Phase I																
Interstate 15																
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	6,466	6,223	11	18	6,477	6,241	0.810	0.780	0.001	0.002	D	C	None
	SB	4	8,000	7,190	7,080	3	16	7,193	7,096	0.899	0.887	0.000	0.002	D	D	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,530	6,285	11	70	6,541	6,355	0.711	0.691	0.285	0.048	C	C	None
	SB	4 + 1	9,200	7,261	7,150	51	82	7,312	7,232	0.795	0.786	0.120	0.085	C	C	None
Balboa Ave to Aero Dr	NB	4 + 1	9,200	6,982	6,720	14	88	6,996	6,808	0.760	0.740	0.002	0.010	C	C	None
	SB	4 + 1	9,200	7,763	7,645	65	104	7,828	7,749	0.851	0.842	0.007	0.011	D	D	None
SR 163																
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	5,078	5,621	2	4	5,080	5,625	0.552	0.611	0.000	0.000	B	B	None
	SB	4 + 1	9,200	5,518	5,778	1	3	5,519	5,781	0.600	0.628	0.000	0.000	B	C	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	5,911	6,543	3	16	5,914	6,559	0.643	0.713	0.000	0.002	C	C	None
	SB	4 + 1	9,200	6,424	6,726	11	18	6,435	6,744	0.699	0.733	0.001	0.002	C	C	None
SR 52																
SR 163 to Kearny Villa Rd	WB	3	6,000	3,983	2,572	9	15	3,992	2,587	0.665	0.431	0.001	0.003	C	B	None
	EB	3	6,000	2,698	3,485	2	12	2,700	3,497	0.450	0.583	0.000	0.002	B	B	None
Kearny Villa Road to I-15	WB	3	4,000	3,983	2,572	1	5	3,984	2,577	0.996	0.644	0.000	0.001	E	C	None
	EB	3	4,000	2,698	3,485	3	5	2,701	3,490	0.675	0.873	0.001	0.001	C	D	None

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.

b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.

c. Existing Peak Hour volumes from *Table 3-5 are based on* Year 2012 ADT volumes from *PeMS*.

d. Project Phase I traffic volumes assigned based on the project trip distribution.

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

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TABLE 8-3
EXISTING + PROJECT PEAK HOUR FREEWAY MAINLINE OPERATIONS

Freeway Segment	Dir.	# of Lanes [a]	Hourly Cap [b]	Existing Peak Hour Volume [c]		Entire Project Traffic [d]		Existing + Project Traffic		V/C		Δ V/C		LOS		Impact Type
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
Existing + Entire Project																
Interstate 15																
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	6,466	6,223	21	51	6,487	6,274	0.811	0.784	0.003	0.006	D	C	None
	SB	4	8,000	7,190	7,080	29	30	7,219	7,110	0.902	0.889	0.004	0.004	D	D	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,530	6,285	130	133	6,660	6,418	0.724	0.698	0.014	0.014	C	C	None
	SB	4 + 1	9,200	7,261	7,150	94	230	7,355	7,380	0.799	0.802	0.010	0.025	C	D	None
Balboa Ave to Aero Dr	NB	4 + 1	9,200	6,982	6,720	165	169	7,147	6,889	0.777	0.749	0.018	0.018	C	C	None
	SB	4 + 1	9,200	7,763	7,645	119	291	7,882	7,936	0.857	0.863	0.013	0.032	D	D	None
SR 163																
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	5,078	5,621	4	10	5,082	5,631	0.552	0.612	0.000	0.001	B	B	None
	SB	4 + 1	9,200	5,518	5,778	6	6	5,524	5,784	0.600	0.629	0.001	0.001	B	C	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	5,911	6,543	29	30	5,940	6,573	0.646	0.714	0.003	0.003	C	C	None
	SB	4 + 1	9,200	6,424	6,726	21	51	6,445	6,777	0.701	0.737	0.002	0.006	C	C	None
SR 52																
SR 163 to Kearny Villa Rd	WB	3	6,000	3,983	2,572	17	41	4,000	2,613	0.667	0.435	0.003	0.007	C	B	None
	EB	3	6,000	2,698	3,485	23	24	2,721	3,509	0.453	0.585	0.004	0.004	B	B	None
Kearny Villa Road to I-15	WB	2	4,000	3,983	2,572	9	9	3,992	2,581	0.998	0.645	0.002	0.002	E	C	None
	EB	2	4,000	2,698	3,485	6	15	2,704	3,500	0.676	0.875	0.002	0.004	C	D	None

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.

b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.

c. Existing Peak Hour volumes from *Table 3-5 are based on* Year 2012 ADT volumes from *PeMS*.

d. Entire Project traffic volumes assigned based on the project trip distribution.

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 8-4
EXISTING + PROJECT RAMP METER ANALYSIS

Location/Condition	Peak Hour	Demand D [a] (veh/hr/ln)	Meter Rate [b] (R) (veh/hr/ln)	Calculated (Most Restrictive)			Maximum Observed [f]		
				Excess Demand [c] E (veh/hr/ln)	Delay [d] (min/ln)	Queue [e]	Delay (Min)	Queue	
								Veh/Ln	Feet
Clairemont Mesa Boulevard / SR 163 Interchange									
WB Clairemont Mesa Boulevard to NB SR 163			12% Reduction to volumes in SOV lanes due to HOV lane				1 SOV + 1 HOV		
Existing - SOV	PM	481	593	0	0	0	0	0	0
Existing - HOV	PM	66	593	0	0	0	0	0	0
Existing + Project Phase 1 - SOV	PM	485	593	0	0	0	0	0	0
Existing + Project Phase 1 - HOV	PM	66	593	0	0	0	0	0	0
Existing + Entire Project - SOV	PM	490	593	0	0	0	0	0	0
Existing + Entire Project - HOV	PM	67	593	0	0	0	0	0	0
WB Clairemont Mesa Boulevard to SB SR 163								2 SOV	
Existing	PM	375	514	0	0	0	0	0	0
Existing + Project Phase 1	PM	385	514	0	0	0	0	0	0
Existing + Entire Project	PM	400	514	0	0	0	0	0	0
Clairemont Mesa Boulevard / I-15 Interchange									
EB Clairemont Mesa Boulevard to NB I-15								2 SOV	
Existing	PM	313	238	75	19	1,875	1	7	175
Existing + Project Phase 1	PM	322	238	84	21	2,100	1	8	200
Existing + Entire Project	PM	339	238	101	25	2,513	1	9	225

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TABLE 8-4 (CONTINUED)
EXISTING + PROJECT RAMP METER ANALYSIS

Location/Condition	Peak Hour	Demand D [a] (veh/hr/ln)	Meter Rate [b] (R) (veh/hr/ln)	Calculated (Most Restrictive)			Maximum Observed [f]		
				Excess Demand [c] E (veh/hr/ln)	Delay [d] (min/ln)	Queue [e]	Delay (Min)	Queue	
								Veh/Ln	Feet
Clairemont Mesa Boulevard / I-15 Interchange (Continued)									
EB Clairemont Mesa Boulevard to SB I-15			11% Reduction to volumes in SOV lanes due to HOV lane				2 SOV+1 HOV		
Existing - SOV	PM	343	312	31	6	777	2	24	600
Existing - HOV	PM	85	312	0	0	0	0	0	0
Existing + Project Phase 1- SOV	PM	380	312	68	13	1,690	4	52	1,300
Existing + Project Phase 1- HOV	PM	94	312	0	0	0	0	0	0
Existing + Entire Project- SOV	PM	445	312	133	26	3,336	9	103	2,575
Existing + Entire Project- HOV	PM	110	312	0	0	0	0	0	0
Balboa Avenue / I-15 Interchange									
EB Balboa Avenue to SB I-15			14% Reduction to volumes in SOV lanes due to HOV lane				2 SOV+1 HOV		
Existing- SOV	PM	517	372	145	23	3,622	6	46	1,150
Existing- HOV	PM	168	372	0	0	0	0	0	0
Existing + Project Phase 1- SOV	PM	526	372	154	25	3,858	7	49	1,225
Existing + Project Phase 1- HOV	PM	171	372	0	0	0	0	0	0
Existing + Entire Project- SOV	PM	543	372	171	28	4,277	7	54	1,350
Existing + Entire Project- HOV	PM	177	372	0	0	0	0	0	0

Footnotes:

a. Demand "D" is the traffic that desires to enter the freeway at this on-ramp during the peak hour.
b. Meter Rate "R" is the *most restrictive* rate at which the ramp meter (signal) discharges traffic on to the freeway(from Caltrans).
c. Excess Demand "E" is the difference between the Demand and the Peak Hour Flow.
d. Delay in minutes per lane experienced by each vehicle, calculated as the ratio of the Excess Demand and the Peak Hour Flow in one minute.
e. Queue is calculated as 25 feet per vehicle (E)
f. Estimated Delay and Queue based on current field observations.

8.1.5 *ILV Operations*

Table 8-5 summarizes the Existing + Project Phase 1 ILV calculations for the freeway interchanges within the study area. As seen in this table, all study area interchange intersections are calculated to continue to operate at under or near capacity with the addition of Project Phase 1 traffic, except for the following:

- Clairemont Mesa Boulevard / I–15 SB intersection - over capacity during both the AM and PM peak hours.

8.2 Existing + Entire Project

8.2.1 *Intersection Analysis*

Table 8-1 summarizes the Existing + Entire Project peak hour intersection operations. As seen in *Table 8-1*, with the addition of the Entire Project traffic, all study area intersections are calculated to continue to operate at LOS D or better. The Existing + Entire Project peak hour analysis worksheets are included in ***Appendix E.***

8.2.2 *Segment Operations*

Table 8-2 summarizes the Existing + Entire Project segment operations. As seen in *Table 8-2*, with the addition of the Entire Project traffic, all segments within the study area are calculated to continue to operate at LOS D or better.

8.2.3 *Freeway Mainline Analysis*

Table 8-3 summarizes the Existing + Entire Project freeway mainline operations. As seen in *Table 8-3*, with the addition of the Entire Project traffic, all study area freeway segments are calculated to operate at LOS D or better except one. The segment of SR 52 between Kearny Villa Road and I-15 is calculated to continue to operate at LOS E in the WB direction. The project has no significant impact since the increase in V/C ratio due to the project traffic is less than 0.005, the allowable increase.

8.2.4 *Freeway Ramp Meter Analysis*

Table 8-4 summarizes the Existing + Entire Project ramp meter operations. As seen in *Table 8-4*, using the most restrictive discharge rates obtained from Caltrans, all HOV lanes operate with no delay or queues with the addition of the Entire Project traffic. However, the SOV lanes at the following ramps have delays of 15 minutes or more:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 25 minutes with a 101-vehicle, or a 2,513-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 26 minutes with a 133-vehicle, or a 3,336-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Delay of 28 minutes with a 171- vehicle, or a 4,277-foot long queue.

TABLE 8-5
EXISTING + PROJECT ILV OPERATIONS

Intersection	Peak Hour	Existing		Existing + Project Phase 1		Existing + Entire Project	
		Operating Level (ILV / Hour)	Capacity	Operating Level (ILV / Hour)	Capacity	Operating Level (ILV / Hour)	Capacity
3. Clairemont Mesa Boulevard / SR-163 NB Ramps	AM	1,260	Near	1,261	Near	1,263	Near
	PM	762	Under	1,020	Under	1,020	Under
10. Clairemont Mesa Boulevard / I-15 SB Ramps	AM	1,778	Over	1,813	Over	1,908	Over
	PM	1,712	Over	1,763	Over	1,931	Over
11. Clairemont Mesa Boulevard / I-15 NB Ramps	AM	1,278	Near	1,289	Near	1,359	Near
	PM	1,049	Under	1,061	Under	1,108	Under
13. Ruffin Road / SR-52 WB Ramps	AM	829	Under	839	Under	855	Under
	PM	1,278	Near	1,293	Near	1,319	Near
14. Ruffin Road / SR-52 WB Ramps	AM	695	Under	701	Under	719	Under
	PM	1,198	Under	1,205	Under	1,218	Under

General Note:

a. CAPACITY is shown as UNDER capacity, NEAR capacity or OVER capacity:
Under *Capacity* = <1200 ILV/Hour
Near Capacity = >1200 but < 1500 ILV/Hour
Over Capacity = >1500 ILV/Hour

b. The Clairemont Mesa Boulevard / SR-163 SB ramps intersection is not analyzed since it is not signalized.

Comparing the calculated values to the maximum observed existing values, with the addition of the Entire Project traffic, the proportionate delays and queues are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 1 minute with a 9-vehicle, or a 225-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 9 minutes with a 103-vehicle, or a 2,575-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Queue: Delay of 7 minutes with a 54-vehicle, or a 1,350-foot long queue.

As seen above, the resulting delays and queues due to the addition of the Entire Project traffic are within acceptable limits (less than 15 minutes).

8.2.5 *ILV Operations*

Table 8-5 summarizes the Existing + Entire Project ILV calculations for the freeway interchanges within the study area. As seen in this table, all study area interchange intersections are calculated to continue to operate at under or near capacity with the addition of the Entire Project traffic, except for the following:

- Clairemont Mesa Boulevard / I–15 SB intersection - over capacity during both the AM and PM peak hours.

9.0 ANALYSIS OF NEAR-TERM SCENARIOS

Existing geometry is used in the analysis of this scenario. No network changes or intersection / segment improvements are assumed.

9.1 Near-Term Without Project

9.1.1 *Intersection Analysis*

Table 9-1 summarizes the Near-Term without Project peak hour intersection operations. As seen in *Table 9-1*, with the addition of Cumulative projects traffic, the following intersections are calculated to operate at LOS E:

- Clairemont Mesa Boulevard / Ruffin Road (LOS E during the PM peak hour)
- Ruffin Road / Balboa Avenue (LOS E during the AM and PM peak hours)

The Near-Term without Project peak hour analysis worksheets are included in ***Appendix F.***

9.1.2 *Segment Operations*

Table 9-2 summarizes the Near-Term without Project segment operations. As seen in *Table 9-2*, with the addition of Cumulative projects traffic, all segments within the study area are calculated to continue to operate at LOS D or better except the segment of Ruffin Road between Spectrum Center Drive and Balboa Avenue, which is calculated to operate at LOS E.

9.1.3 *Freeway Mainline Analysis*

Table 9-3 summarizes the Existing Plus Cumulative projects freeway mainline operations. As seen in *Table 9-3*, with the addition of Cumulative projects traffic, all study area freeway segments are calculated to operate at LOS D or better except one. The segment of SR 52 between Kearny Villa Road and I-15 is calculated to continue to operate at LOS E in the WB direction during the AM peak hour.

9.1.4 *Freeway Ramp Meter Analysis*

Table 9-4 summarizes the Near-Term without Project ramp meter operations. As seen in *Table 9-4*, using the most restrictive discharge rates obtained from Caltrans, all HOV lanes operate with no delay or queues with the addition of Cumulative Projects traffic. However, the SOV lanes at the following ramps have delays of 15 minutes or more:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 24 minutes with a 94-vehicle, or a 2,350-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Delay of 37 minutes with a 227-vehicle, or a 5,686-foot long queue.

Comparing the calculated values to the maximum observed existing values, with the addition of Cumulative projects traffic, the proportionate delays and queues are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 1 minute with a 9-vehicle, or a 225-foot long queue.

- Balboa Avenue / SB I-15 On-Ramp: Delay of 10 minutes with a 72-vehicle, or a 1,800-foot long queue.

As seen above, based on the field observations, the estimated delays with the addition of Cumulative projects traffic are within acceptable limits (less than 15 minutes).

9.1.5 *ILV Operations*

Table 9-5 summarizes the Near-Term without Project ILV calculations for the freeway interchanges within the study area. As seen in this table, all study area interchange intersections are calculated to continue to operate at under or near capacity with the addition of the Entire Project traffic, except for the following:

- Clairemont Mesa Boulevard / I–15 SB intersection - over capacity during both the AM and PM peak hours.

The Near-Term without Project ILV analysis worksheets are included in *Appendix F*.

9.2 Near-Term + Project Phase I

9.2.1 *Intersection Analysis*

Table 9-1 summarizes the Near-Term + Project Phase I peak hour intersection operations. As seen in *Table 9-1*, with the addition of the Entire Project traffic, the following intersections are calculated to operate at LOS E or worse:

- Clairemont Mesa Boulevard / Ruffin Road (LOS E during the PM peak hour)
- Ruffin Road / Balboa Avenue (LOS E during the AM and PM peak hours)

With the addition of Project Phase I traffic, and based on the City's established significance criteria, the project does not have a significant direct impact at the above two intersections since the increase in delay due to project traffic is less than the allowable 2.0 seconds respectively at these intersections operating at LOS E.

The Near-Term + Project Phase I peak hour analysis worksheets are included in ***Appendix G.***

9.2.2 *Segment Operations*

Table 9-2 summarizes the Near-Term + Project Phase I segment operations. As seen in *Table 9-2*, with the addition of the Entire Project traffic, all segments within the study area are calculated to operate at LOS C or better or better except the segment of Ruffin Road between Spectrum Center Drive and Balboa Avenue, which is calculated to operate at LOS E.

However, the increase in V/C ratio due to the addition of project traffic is less than 0.02 on this segment calculated to operate at LOS E, the allowable increase in the V/C ratio. Therefore, the project has no significant impact on this segment.

TABLE 9-1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term without Project		Near-Term + Project Phase I		Δ [c] Delay	Impact Type	Near-Term + Entire Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
1. Clairemont Mesa Blvd / Kearny Mesa Rd	Signal	AM	17.9	B	18.2	B	0.3	None	20.3	B	2.4	None
		PM	31.6	C	31.7	C	0.2	None	32.8	C	1.3	None
2. Clairemont Mesa Blvd / SR 163 SB Ramps	MSSC [d]	AM	13.6	B	14.0	B	0.4	None	14.4	B	0.8	None
		PM	11.8	B	12.7	B	0.9	None	13.0	B	1.2	None
3. Clairemont Mesa Blvd / SR 163 NB Ramps	Signal	AM	22.6	C	25.5	C	2.9	None	25.8	C	3.2	None
		PM	11.5	C	24.2	C	12.7	None	26.5	C	15.0	None
4. Clairemont Mesa Blvd / Kearny Villa Rd [e]	Signal	AM	42.1	D	46.0	D	3.9	None	49.1	D	7.0	None
		PM	34.7	D	39.5	D	4.8	None	43.4	D	8.7	None
5. Clairemont Mesa Blvd / Complex Dr [e]	Signal	AM	13.3	B	19.1	B	5.8	None	23.2	B	9.9	None
		PM	15.0	B	17.5	B	2.5	None	18.2	B	3.2	None
6. Clairemont Mesa Blvd / Overland Ave [e]	Signal	AM	34.2	C	48.7	D	14.5	None	53.7	D	19.5	None
		PM	38.6	D	51.0	D	12.4	None	54.3	D	15.7	None
7. Clairemont Mesa Blvd / Ruffin Rd [e]	Signal	AM	33.1	C	42.8	D	9.7	None	50.0	D	16.9	None
		PM	57.0	E	57.2	E	0.2	None	**59.6**	**E**	**2.6**	**Direct**
8. Clairemont Mesa Blvd / Project Access Dwy [f]	Signal	AM	DNE	DNE	13.9	B	NA	None	15.5	B	NA	None
		PM	DNE	DNE	14.2	B	NA	None	26.4	C	NA	None
9. Clairemont Mesa Blvd / Murphy Canyon Rd [e]	Signal	AM	15.7	B	17.3	B	1.6	None	19.2	B	3.5	None
		PM	19.5	C	28.0	C	8.5	None	29.7	C	10.2	None
10. Clairemont Mesa Blvd / I-15 SB Ramps	Signal	AM	23.6	C	25.1	C	1.5	None	25.7	C	2.1	None
		PM	23.1	C	24.8	C	1.7	None	25.1	C	2.0	None

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TABLE 9–1 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term without Project		Near-Term + Project Phase I		Δ [c] Delay	Impact Type	Near-Term + Entire Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
11. Clairemont Mesa Blvd /	Signal	AM	24.6	C	24.9	C	0.3	None	26.6	C	2.0	None
I-15 SB Ramps		PM	15.1	B	20.4	C	5.3	None	21.4	C	6.3	None
12. Lightwave Ave /	Signal	AM	20.0	C	20.3	C	0.3	None	20.3	C	0.3	None
Overland Ave		PM	24.2	C	24.3	C	0.1	None	24.6	C	0.4	None
13. Ruffin Rd /	Signal	AM	20.6	C	21.8	C	1.2	None	22.4	C	1.8	None
SR 52 WB Ramps		PM	20.8	B	23.1	C	2.3	None	24.2	C	3.4	None
14. Ruffin Rd /	Signal	AM	15.1	B	16.9	B	1.8	None	17.3	B	2.2	None
SR 52 EB Ramps		PM	44.9	D	47.8	D	2.9	None	47.9	D	3.0	None
15. Ruffin Rd /	Signal	AM	13.0	B	13.5	B	0.5	None	13.5	B	0.5	None
Kearny Villa Rd		PM	19.6	B	21.1	C	1.5	None	26.9	C	7.3	None
16. Ruffin Rd /	Signal	AM	12.7	B	12.7	B	0.0	None	12.8	B	0.1	None
Chesapeake Dr		PM	14.8	B	14.8	B	0.0	None	14.9	B	0.1	None
17. Ruffin Rd /	Signal	AM	9.0	A	9.7	A	0.7	None	12.7	B	3.7	None
Hazard Wy		PM	11.0	B	11.1	B	0.1	None	11.3	B	0.3	None
18. Ruffin Rd /	Signal	AM	10.3	B	10.3	B	0.0	None	10.3	B	0.0	None
Farnham St		PM	14.8	B	14.9	B	0.1	None	14.9	B	0.1	None
19. Ruffin Rd /	MSSC	AM	DNE	DNE	9.7	A	NA	None	9.8	A	NA	None
Project Access Dwy [f]		PM	DNE	DNE	9.6	A	NA	None	9.7	A	NA	None
20. Ruffin Rd /	Signal	AM	23.8	C	25.6	C	1.8	None	25.9	C	2.1	None
Ruffin Ct		PM	27.8	C	33.4	C	5.6	None	38.2	D	10.4	None

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TABLE 9–1 (CONTINUED)
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term without Project		Near-Term + Project Phase I		Δ [c] Delay	Impact Type	Near-Term + Entire Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
21. Ruffin Rd /	Signal	AM	14.9	B	15.2	B	0.3	None	15.4	B	0.5	None
Spectrum Center Blvd		PM	23.8	C	34.9	C	11.1	None	35.5	D	11.7	None
22. Ruffin Rd /	Signal	AM	55.2	E	55.4	E	0.2	None	55.6	E	0.4	None
Balboa Ave		PM	68.1	E	68.5	E	0.4	None	**73.7**	**E**	**5.6**	**Direct**
23. Viewridge Ave /	Signal	AM	16.9	B	18.5	B	1.6	None	19.8	B	2.9	None
Balboa Ave		PM	39.2	D	41.6	D	2.4	None	45.8	D	6.6	None
24. Ruffin Ct /	MSSC	AM	DNE	DNE	11.3	B	NA	None	12.9	B	NA	None
Project Dwy #3 [f]		PM	DNE	DNE	12.2	B	NA	None	15.8	C	NA	None
25. Ruffin Ct /	MSSC	AM	DNE	DNE	10.3	B	NA	None	10.7	B	NA	None
Project Dwy #4 [f]		PM	DNE	DNE	10.7	B	NA	None	11.5	B	NA	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to project traffic.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn / approach delay is reported.
e. These intersections are part of a coordinated signal system
f. The project driveways are only analyzed in the "with Project" scenarios.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Note:

DNE – Does not exist
NA – Not Applicable
BOLD indicates a significant impact

TABLE 9–2
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	Near-Term Without Project			Near-Term with Project Phase I			Δ V/C	Impact Type	Near-Term with Entire Project			Δ V/C	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C			ADT	LOS	V/C		
Clairemont Mesa Boulevard															
SR 163 NB Ramps to Kearny Villa Rd	6-lane Prime	60,000	42,060	C	0.701	42,530	C	0.709	0.008	None	43,130	C	0.719	0.018	None
Kearny Villa Rd to Complex Dr	6-lane Major	50,000	31,130	C	0.623	31,600	C	0.632	0.009	None	32,200	C	0.644	0.021	None
Kearny Villa Rd to Overland Ave	6-lane Major	50,000	33,930	C	0.679	34,400	C	0.688	0.009	None	35,000	C	0.700	0.021	None
Overland Ave to Ruffin Rd	6-lane Major	50,000	27,870	B	0.557	29,190	C	0.584	0.027	None	30,210	C	0.604	0.047	None
Ruffin Rd to Project Access Dwy	5-lane Major	45,000	29,200	C	0.649	30,520	C	0.678	0.029	None	31,540	C	0.701	0.053	None
Project Access Dwy to Murphy Cnyn Rd	5-lane Major	45,000	28,850	C	0.641	34,650	C	0.770	0.129	None	39,110	C	0.869	0.229	None
Murphy Canyon Rd to I-15	6-lane Major	50,000	25,220	B	0.504	27,270	B	0.545	0.041	None	29,930	D	0.599	0.095	None
Lightwave Avenue															
Overland Ave to Ruffin Rd	4-Lane Col	30,000	10,870	A	0.362	11,010	A	0.367	0.005	None	11,200	A	0.373	0.011	None
Ruffin Court															
Ruffin Rd to Project Dwy	2-Lane Col	15,000	3,680	A	0.245	5,510	B	0.367	0.122	None	5,170	B	0.345	0.100	None
Balboa Avenue															
Ponderosa Ave to Ruffin Rd	4-Lane Major	40,000	24,100	C	0.603	24,170	C	0.604	0.001	None	24,270	C	0.607	0.004	None
Ruffin Rd to Viewridge Ave	6-Lane Prime	60,000	30,040	B	0.501	30,180	B	0.503	0.002	None	30,370	B	0.506	0.005	None
Viewridge Ave to I-15	6-Lane Prime	60,000	37,980	C	0.633	38,410	C	0.640	0.007	None	38,970	C	0.650	0.017	None
Viewridge Avenue															
South of Ruffin Ct	2-Lane Col	15,000	4,230	A	0.282	4,520	A	0.301	0.019	None	4,890	A	0.326	0.044	None
North of Balboa Ave	2-Lane Col	15,000	6,430	B	0.429	6,720	B	0.448	0.019	None	7,090	C	0.473	0.044	None

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TABLE 9–2 (CONTINUED)
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	Near-Term without Project			Near-Term with Project Phase I			Δ V/C	Impact Type	Near-Term with Entire Project			Δ V/C	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C			ADT	LOS	V/C		
Ruffin Road															
SR 52 to Kearny Villa Rd	4-Lane Major	40,000	23,610	C	0.590	24,000	C	0.600	0.010	None	24,520	D	0.613	0.023	None
Kearny Villa Rd to Chesapeake Dr	4-Ln Col	30,000	19,050	C	0.635	19,440	C	0.648	0.013	None	19,960	C	0.665	0.030	None
Chesapeake Dr to Hazard Wy	4-Ln Col	30,000	19,390	C	0.646	19,780	C	0.659	0.013	None	20,300	D	0.677	0.031	None
Hazard Wy to Farnham St	4-Ln Col	30,000	19,280	C	0.643	19,670	C	0.656	0.013	None	20,190	D	0.673	0.030	None
Farnham St to Clairemont Mesa Blvd	4-Ln Col	30,000	21,870	D	0.729	22,260	D	0.742	0.013	None	22,780	D	0.759	0.030	None
Clairemont Mesa Blvd to Project Dwy	4-Ln Col	30,000	18,690	C	0.623	20,420	D	0.681	0.058	None	21,750	D	0.725	0.102	None
Project Dwy to Ruffin Ct	4-Ln Col	30,000	19,430	C	0.648	21,160	D	0.705	0.057	None	22,490	D	0.750	0.102	None
Ruffin Crt to Spectrum Ctr Blvd	4-Ln Col	30,000	19,230	C	0.641	19,480	C	0.649	0.008	None	19,810	C	0.660	0.019	None
Spectrum Ctr Blvd to Balboa Ave	4-Ln Col	30,000	25,040	E	0.835	25,290	E	0.843	0.008	None	25,620	E	0.854	0.019	None

Footnotes:

a. Capacities based on City of San Diego Roadway Capacity Table.

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity.

TABLE 9–3
NEAR-TERM FREEWAY MAINLINE SEGMENT OPERATIONS

NEAR-TERM WITHOUT PROJECT

Freeway Segment	Dir.	# of Lanes [a]	Hourly Capacity [b]	Existing [c]		Cumulative Projects Traffic [d]		Near-Term Traffic Without Project		V/C [f]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Interstate 15													
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	6,466	6,223	8	38	6,474	6,261	0.809	0.783	D	C
	SB	4	8,000	7,190	7,080	0	0	7,190	7,080	0.899	0.885	D	D
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,530	6,285	124	59	6,654	6,344	0.723	0.690	C	C
	SB	4 + 1	9,200	7,261	7,150	0	0	7,261	7,150	0.789	0.777	C	C
Balboa Ave to Aero Dr	NB	4 + 1	9,200	6,982	6,720	316	154	7,298	6,874	0.793	0.747	C	C
	SB	4 + 1	9,200	7,763	7,645	40	180	7,803	7,825	0.848	0.850	D	D
SR 163													
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	5,078	5,621	35	133	5,113	5,754	0.556	0.625	B	C
	SB	4 + 1	9,200	5,518	5,778	240	147	5,758	5,925	0.626	0.644	C	C
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	5,911	6,543	210	107	6,121	6,650	0.665	0.723	C	C
	SB	4 + 1	9,200	6,424	6,726	47	268	6,471	6,994	0.703	0.760	C	C
SR 52													
SR 163 to Kearny Villa Rd	WB	3	6,000	3,983	2,572	9	108	3,992	2,680	0.665	0.447	C	B
	EB	3	6,000	2,698	3,485	106	38	2,804	3,523	0.467	0.587	B	B
Kearny Villa Rd to I-15	WB	2	4,000	3,983	2,572	0	11	3,983	2,583	0.996	0.646	E	C
	EB	2	4,000	2,698	3,485	0	0	2,698	3,485	0.674	0.871	C	D

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.

b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.

c. Existing Peak Hour volumes from *Table 3-5*.

d. Cumulative projects traffic volumes.

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 9-3 (CONTINUED)
NEAR-TERM PEAK HOUR FREEWAY MAINLINE OPERATIONS

NEAR-TERM + PROJECT PHASE I

Freeway Segment	Dir.	# of Lanes [a]	Hourly Cap [b]	Near-Term without Project Traffic [c]		Project Phase I [d]		Near-Term with Project Phase I		V/C		Δ V/C		LOS		Impact Type
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
Interstate 15																
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	6,474	6,261	11	18	6,485	6,279	0.811	0.785	0.001	0.002	D	C	None
	SB	4	8,000	7,190	7,080	3	16	7,193	7,096	0.899	0.887	0.000	0.002	D	D	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,654	6,344	11	70	6,665	6,414	0.724	0.697	0.001	0.008	C	C	None
	SB	4 + 1	9,200	7,261	7,150	51	82	7,312	7,232	0.795	0.786	0.006	0.009	C	C	None
Balboa Ave to Aero Dr	NB	4 + 1	9,200	7,298	6,874	14	88	7,312	6,962	0.795	0.757	0.002	0.010	C	C	None
	SB	4 + 1	9,200	7,803	7,825	65	104	7,868	7,929	0.855	0.862	0.007	0.011	D	D	None
SR 163																
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	5,113	5,754	2	4	5,115	5,758	0.556	0.626	0.000	0.000	B	C	None
	SB	4 + 1	9,200	5,758	5,925	1	3	5,759	5,928	0.626	0.644	0.000	0.000	C	C	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,121	6,650	2	16	6,123	6,666	0.666	0.725	0.000	0.002	C	C	None
	SB	4 + 1	9,200	6,471	6,994	12	18	6,483	7,012	0.705	0.762	0.001	0.002	C	C	None
SR 52																
SR 163 to Kearny Villa Rd	WB	3	6,000	3,992	2,680	10	15	4,002	2,695	0.667	0.449	0.002	0.003	C	B	None
	EB	3	6,000	2,804	3,523	2	12	2,806	3,535	0.468	0.589	0.000	0.002	B	B	None
Kearny Villa Rd to I-15	WB	2	4,000	3,983	2,583	1	5	3,984	2,588	0.996	0.647	0.000	0.001	E	C	None
	EB	2	4,000	2,698	3,485	3	5	2,701	3,490	0.675	0.873	0.001	0.001	C	D	None

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.

b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.

c. Existing Peak Hour volumes from *Table 3-5*.

d. Project Phase I traffic volumes.

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 9-3 (CONTINUED)
NEAR-TERM PEAK HOUR FREEWAY MAINLINE OPERATIONS

NEAR-TERM + ENTIRE PROJECT

Freeway Segment	Dir.	# of Lanes [a]	Hourly Cap [b]	Near-Term without Project Traffic [c]		Entire Project Traffic [d]		Near-Term with Entire Project		V/C		Δ V/C		LOS		Impact Type
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
Interstate 15																
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	6,474	6,261	21	51	6,495	6,312	0.812	0.789	0.003	0.006	D	C	None
	SB	4	8,000	7,190	7,080	29	30	7,219	7,110	0.902	0.889	0.004	0.004	D	D	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,654	6,344	130	133	6,784	6,477	0.737	0.704	0.014	0.014	C	C	None
	SB	4 + 1	9,200	7,261	7,150	94	230	7,355	7,380	0.799	0.802	0.010	0.025	C	D	None
Balboa Ave to Aero Dr	NB	4 + 1	9,200	7,298	6,874	165	169	7,463	7,043	0.811	0.765	0.018	0.018	D	C	None
	SB	4 + 1	9,200	7,803	7,825	119	291	7,922	8,116	0.861	0.882	0.013	0.032	D	D	None
SR 163																
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	5,113	5,754	4	10	5,117	5,764	0.556	0.626	0.000	0.001	B	C	None
	SB	4 + 1	9,200	5,758	5,925	5	6	5,763	5,931	0.626	0.645	0.001	0.001	C	C	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	6,121	6,650	25	30	6,146	6,680	0.668	0.726	0.003	0.003	C	C	None
	SB	4 + 1	9,200	6,471	6,994	20	51	6,491	7,045	0.706	0.766	0.002	0.006	C	C	None
SR 52																
SR 163 to Kearny Villa Rd	WB	3	6,000	3,992	2,680	16	41	4,008	2,721	0.668	0.453	0.003	0.007	C	B	None
	EB	3	6,000	2,804	3,523	20	24	2,824	3,547	0.471	0.591	0.003	0.004	B	B	None
Kearny Villa Rd to I-15	WB	2	4,000	3,983	2,583	8	9	3,991	2,592	0.998	0.648	0.002	0.002	E	C	None
	EB	2	4,000	2,698	3,485	6	15	2,704	3,500	0.676	0.875	0.002	0.004	C	D	None

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.

b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.

c. Existing Peak Hour volumes from *Table 3-5*.

d. Entire Project traffic volumes.

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 9-4
NEAR-TERM RAMP METER ANALYSIS

Location/Condition	Peak Hour	Demand D [a] (veh/hr/ln)	Meter Rate [b] (R) (veh/hr/ln)	Calculated (Most Restrictive)			Maximum Observed [g]		
				Excess Demand [d] E (veh/hr/ln)	Delay [e] (min/ln)	Queue [f]	Delay (Min)	Queue	
								Veh/Ln	Feet
Clairemont Mesa Boulevard / SR 163 Interchange									
WB Clairemont Mesa Boulevard to NB SR 163			12% Reduction to volumes in SOV lanes due to HOV lane				1 SOV + 1 HOV		
Existing - SOV	PM	481	593	0	0	0	0	0	0
Existing - HOV	PM	66	593	0	0	0	0	0	0
Near-Term Without Project - SOV	PM	598	593	5	1	135	0	0	0
Near-Term Without Project - HOV	PM	82	593	0	0	0	0	0	0
Near-Term + Project Phase I - SOV	PM	602	593	9	1	223	0	0	0
Near-Term + Project Phase I - HOV	PM	82	593	0	0	0	0	0	0
Near-Term + Entire Project - SOV	PM	607	593	14	1	355	0	0	0
Near-Term + Entire Project - HOV	PM	83	593	0	0	0	0	0	0
WB Clairemont Mesa Boulevard to SB SR 163								2 SOV	
Existing	PM	375	514	0	0	0	0	0	0
Near-Term Without Project	PM	458	514	0	0	0	0	0	0
Near-Term + Project Phase I	PM	458	514	0	0	0	0	0	0
Near-Term + Entire Project	PM	481	514	0	0	0	0	0	0
Clairemont Mesa Boulevard / I-15 Interchange									
EB Clairemont Mesa Boulevard to NB I-15								2 SOV	
Existing	PM	313	238	75	19	1,875	1	7	175
Near-Term Without Project	PM	332	238	94	24	2,350	1	9	225
Near-Term + Project Phase I	PM	332	238	94	24	2,350	1	9	225
Near-Term + Entire Project	PM	358	238	120	30	2,988	1	11	275

TABLE 9-4 (CONTINUED)
NEAR-TERM RAMP METER ANALYSIS

Location/Condition	Peak Hour	Demand D [a] (veh/hr/ln)	Meter Rate [b] (R) (veh/hr/ln)	Calculated (Most Restrictive)			Maximum Observed [f]		
				Excess Demand [c] E (veh/hr/ln)	Delay [d] (min/ln)	Queue [e]	Delay (Min)	Queue	
								Veh/Ln	Feet
EB Clairemont Mesa Boulevard to SB I-15			11% Reduction to volumes in SOV lanes due to HOV lane				2 SOV + 1 HOV		
Existing - SOV	PM	343	312	31	6	777	2	24	600
Existing - HOV	PM	85	312	0	0	0	0	0	0
Near-Term Without Project - SOV	PM	343	312	31	6	777	2	24	600
Near-Term Without Project - HOV	PM	85	312	0	0	0	0	0	0
Near-Term + Project Phase I - SOV	PM	380	312	68	13	1,690	4	52	1,300
Near-Term + Project Phase I - HOV	PM	94	312	0	0	0	0	0	0
Near-Term + Entire Project - SOV	PM	445	312	133	26	3,336	9	103	2,575
Near-Term + Entire Project - HOV	PM	110	312	0	0	0	0	0	0
Balboa Avenue / I-15 Interchange									
EB Balboa Avenue to SB I-15			14% Reduction to volumes in SOV lanes due to HOV lane				2 SOV + 1 HOV		
Existing - SOV	PM	517	372	145	23	3,622	6	46	1,150
Existing - HOV	PM	168	372	0	0	0	0	0	0
Near-Term Without Project - SOV	PM	599	372	227	37	5,686	10	72	1,800
Near-Term Without Project - HOV	PM	195	372	0	0	0	0	0	0
Near-Term + Project Phase I – SOV	PM	609	372	237	38	5,922	10	75	1,875
Near-Term + Project Phase I - HOV	PM	198	372	0	0	0	0	0	0
Near-Term + Entire Project - SOV	PM	626	372	254	41	6,341	11	81	2,025
Near-Term + Entire Project - HOV	PM	204	372	0	0	0	0	0	0

Footnotes:

a. Demand "D" is the traffic that desires to enter the freeway at this on-ramp during the peak hour.
b. Meter Rate "R" is the *most restrictive* rate at which the ramp meter (signal) discharges traffic on to the freeway (obtained from Caltrans).
c. Excess Demand "E" is the difference between the Demand and the Peak Hour Flow.
d. Delay in minutes per lane experienced by each vehicle, calculated as the ratio of the Excess Demand and the Peak Hour Flow in one minute.
e. Queue is calculated as 25 feet per vehicle (E)
f. Estimated Delay and Queue based on current field observations.

TABLE 9-5
NEAR-TERM ILV OPERATIONS

Intersection	Peak Hour	Near-Term Without Project		Near-Term + Project Phase 1		Near-Term + Entire Project	
		Operating Level (ILV / Hour)	Capacity	Operating Level (ILV / Hour)	Capacity	Operating Level (ILV / Hour)	Capacity
3. Clairemont Mesa Boulevard / SR-163 NB Ramps	AM	1,396	Near	1,396	Near	1,399	Near
	PM	1,020	Under	1,020	Under	1,020	Under
10. Clairemont Mesa Boulevard / I-15 SB Ramps	AM	1,856	Over	1,868	Over	1,982	Over
	PM	1,731	Over	1,769	Over	1,931	Over
11. Clairemont Mesa Boulevard / I-15 NB Ramps	AM	1,371	Near	1,382	Near	1,452	Near
	PM	1,070	Under	1,107	Under	1,159	Under
13. Ruffin Road / SR-52 WB Ramps	AM	935	Under	945	Under	961	Under
	PM	1,440	Near	1,455	Near	1,481	Near
14. Ruffin Road / SR-52 EB Ramps	AM	812	Under	817	Under	835	Under
	PM	1,304	Under	1,312	Under	1,325	Near

General Note:

a. CAPACITY is shown as UNDER capacity, NEAR capacity or OVER capacity:
Under *Capacity* = <1200 ILV/Hour
Near Capacity = >1200 but < 1500 ILV/Hour
Over Capacity = >1500 ILV/Hour

b. The Clairemont Mesa Boulevard / SR-163 SB ramps intersection is not analyzed since it is not signalized.

9.2.3 *Freeway Mainline Analysis*

Table 9-3 summarizes the Near-Term + Project Phase I freeway mainline operations. As seen in *Table 9-3*, with the addition of the Entire Project traffic, all study area freeway segments are calculated to operate at LOS D or better except one. The segment of SR 52 between Kearny Villa Road and I-15 is calculated to continue to operate at LOS E in the WB direction during the AM peak hour. However, since the increase in the V/C ratio due to the project traffic is 0.003, less than allowable 0.005, the project does not have a significance direct impact.

9.2.4 *Freeway Ramp Meter Analysis*

Table 9-4 summarizes the Near-Term + Project Phase I ramp meter operations. As seen in *Table 9-4*, using the most restrictive discharge rates obtained from Caltrans, all HOV lanes operate with no delay or queues with the addition of Cumulative Projects traffic with the addition of the Project Phase I traffic. However, the SOV lanes at the following ramps have delays of 15 minutes or more.

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 24 minutes with a 94-vehicle, or a 2,350-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Delay of 38 minutes with a 237-vehicle, or a 5,922-foot long queue.

Comparing the calculated values to the maximum observed existing values, with the addition of the Project Phase I traffic, the proportionate delays and queues are estimated to be:

The actual delays and queues based on the existing observations are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 1 minute with a 9-vehicle, or a 225-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Queue – Delay of 10 minutes with a 75-vehicle, or a 1,875-foot long queue.

As seen above, based on the field observations, the estimated delays with the addition of Project Phase I traffic are within acceptable limits (less than 15 minutes).

9.2.5 *ILV Operations*

Table 9-5 summarizes the Near-Term with Project Phase 1 ILV calculations for the freeway interchanges within the study area. As seen in this table, all study area interchange intersections are calculated to continue to operate at under or near capacity with the addition of the Entire Project traffic, except for the following:

- Clairemont Mesa Boulevard / I–15 SB intersection - over capacity during both the AM and PM peak hours.

The Near-Term + Project Phase I ILV analysis worksheets are included in *Appendix G***.**

9.3 Near-Term + Entire Project

9.3.1 *Intersection Analysis*

Table 9-1 summarizes the Near-Term + Entire Project peak hour intersection operations. As seen in *Table 9-1*, with the addition of the Entire Project traffic, the following intersections are calculated to operate at LOS E or worse:

- Clairemont Mesa Boulevard / Ruffin Road (LOS E during the PM peak hour)
- Ruffin Road / Balboa Avenue (LOS E during the AM and PM peak hour)

Based on the City's established significance criteria, the project has significant direct impacts at the above two intersections.

The Near-Term + Entire Project peak hour analysis worksheets are included in ***Appendix H.***

9.3.2 *Segment Operations*

Table 9-2 summarizes the Near-Term + Entire Project segment operations. As seen in *Table 9-2*, with the addition of the Entire Project traffic, all segments within the study area are calculated to operate at LOS C or better except the segment of Ruffin Road between Spectrum Center Drive and Balboa Avenue, which is calculated to operate at LOS E.

However, the increase in V/C ratio due to the addition of project traffic is less than 0.02 on this segment calculated to operate at LOS E, the allowable increase in the V/C ratio. Therefore, the project has no significant impact on this segment.

9.3.3 *Freeway Mainline Analysis*

Table 9-3 summarizes the Near-Term + Entire Project freeway mainline operations. As seen in *Table 9-3*, with the addition of the Entire Project traffic, all study area freeway segments are calculated to operate at LOS D or better except one. The segment of SR 52 between Kearny Villa Road and I-15 is calculated to continue to operate at LOS E in the WB direction during the AM peak hour. However, since the increase in the V/C ratio due to the project traffic is 0.003, less than allowable 0.005, the project does not have a significance direct impact.

9.3.4 *Freeway Ramp Meter Analysis*

Table 9-4 summarizes the Near-Term + Entire Project ramp meter operations. As seen in *Table 9-4*, using the most restrictive discharge rates obtained from Caltrans, all HOV lanes operate with no delay or queues with the addition of Cumulative Projects traffic with the addition of the Entire Project traffic. However, the SOV lanes at the following ramps have delays of 15 minutes or more.

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 30 minutes with a 120-vehicle, or a 2988-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 26 minutes with a 133-vehicle, or a 3,336-foot long queue.

- Balboa Avenue / SB I-15 On-Ramp: Delay of 41 minutes with a 254-vehicle, or a 6,341-foot long queue.

Comparing the calculated values to the maximum observed existing values, with the addition of the Entire Project traffic, the proportionate delays and queues are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 1 minute with a 11-vehicle, or a 275-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 9 minutes with a 103-vehicle, or a 2,575-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Queue: Delay of 11 minutes with a 81-vehicle, or a 2,025-foot long queue.

As seen above, based on the field observations, the estimated delays with the addition of the Entire Project traffic are within acceptable limits (less than 15 minutes).

9.3.5 *ILV Operations*

Table 9-5 summarizes the Near-Term with Entire Project ILV calculations for the freeway interchanges within the study area. As seen in this table, all study area interchange intersections are calculated to continue to operate at under or near capacity with the addition of the Entire Project traffic, except for the following:

- Clairemont Mesa Boulevard / I–15 SB intersection - over capacity during both the AM and PM peak hours.

The Near-Term + Entire Project ILV analysis worksheets are included in *Appendix H.*

10.0 ANALYSIS OF LONG-TERM SCENARIOS

10.1 Year 2035 Forecasted Volumes

A review of the SANDAG Year 2035 Series 12 volumes revealed that trips generated by the subject Traffic Analysis Zone (TAZ) within which the project site is located per the Year 2035 SANDAG plot included land uses with a substantial amount of traffic from the project site. In order to determine the "without project" volumes, this additional number of trips was first distributed and assigned to the surrounding street network using the project trip distribution (*Figure 8-1*). These volumes were then removed from the Year 2035 volumes to obtain the Year 2035 "without" project traffic volumes.

The SANDAG model outputs daily segment and peak hour volumes. However, the SANDAG model output is not as accurate in determining peak hour intersection turn movements. Therefore, Year 2035 peak hour turning movement volumes were estimated using a template in EXCEL developed by LLG to determine peak hour traffic at an intersection from future (adjusted Year 2035) ADT volumes using the relationship between existing peak hour turn movements and the existing ADT volumes. This same relationship can be assumed to generally continue in the future. For example, if the segment ADT on the roadway is forecast to double by the Year 2035, it is reasonable to assume that the peak hour intersection turning movement volumes will generally double.

The project traffic was added to the adjusted Year 2035 without project traffic volumes to obtain Year 2035 + Project traffic volumes.

Figure 10-1 depicts the Year 2035 Without Project traffic volumes, while ***Figure 10-2*** depicts the Year 2035 With Project traffic volumes. ***Appendix I*** contains the Year 2035 without project volume plot for the Study Area and the Map showing the Traffic Analysis Zones (TAZ).

10.2 Network Changes

The project will install a third eastbound through lane on Clairemont Mesa Boulevard between Ruffin Road and Murphy Canyon Road on project opening day (Year 2017). It is therefore assumed that the segment of Clairemont Mesa Boulevard between Ruffin Road and Murphy Canyon Road will be a 6-lane Major Road.

10.3 Year 2035 Without Project

10.3.1 *Intersection Analysis*

Table 10-1 summarizes the Year 2035 peak hour intersection operations. As seen in *Table 10-1*, the following intersections are calculated to operate at LOS E or worse in the year 2035 without Project scenario:

- Clairemont Mesa Boulevard / Ruffin Road (LOS E during the PM peak hour).
- Balboa Avenue / Ruffin Road (LOS E during the PM peak hour).

The Year 2035 without Project peak hour analysis worksheets are included in ***Appendix J.***

10.3.2 *Segment Operations*

Table 10-2 summarizes the Year 2035 segment operations. As seen in *Table 10-2*, the following segments are calculated to operate at LOS E or worse in the year 2035 without Project scenario:

- Viewridge Avenue: North of Balboa Avenue (LOS F)
- Balboa Avenue: Ponderosa Avenue to Ruffin Road (LOS E)

10.3.3 *Freeway Mainline Analysis*

Table 10-3 summarizes the Year 2035 freeway mainline operations. As seen in *Table 10-3*, all study area freeway segments are calculated to operate at LOS D or better except the following in the year 2035 without Project scenario:

- **I-15:** Clairemont Mesa Boulevard to Balboa Avenue (SB - LOS F(0) in the AM and LOS E in the PM Peak hour)
- **I-15:** Balboa Avenue to Aero Drive (NB - LOS E in the AM and PM peak hours and SB - LOS F(0) in the AM and PM Peak hours)
- **SR 52:** Kearny Villa Road to I-15 (WB - LOS E in the AM peak hour and EB LOS E in the AM and LOS F(1) in the PM peak hour)

10.3.4 *Freeway Ramp Meter Analysis*

Table 10-4 summarizes the Year 2035 Without project ramp meter operations. As seen in *Table 10-4*, with the addition of the Entire Project traffic, using the most restrictive discharge rates obtained from Caltrans, the results show:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 65 minutes with a 257-vehicle, or a 6,425-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 38 minutes with a 195-vehicle, or a 4,883-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Delay of 55 minutes with a 339-vehicle, or a 8,481-foot long queue.

Comparing the calculated values to the maximum observed existing values, the proportionate delays and queues for the Year 2035 without project traffic are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 3 minutes with a 24-vehicle, or a 600-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 25 minutes with a 299-vehicle, or a 7,475-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Queue: Delay of 15 minutes with a 112-vehicle, or a 2,800-foot long queue.

TABLE 10-1
LONG-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2035 Without Project		Year 2035 With Project		Δ [c] Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS		
1. Clairemont Mesa Blvd / Kearny Mesa Rd	Signal	AM	20.5	C	20.7	C	0.2	None
		PM	34.6	C	34.9	D	0.3	None
2. Clairemont Mesa Blvd / SR 163 SB Ramps	MSSC [d]	AM	14.0	B	15.1	B	1.1	None
		PM	10.5	B	11.4	C	0.9	None
3. Clairemont Mesa Blvd / SR 163 NB Ramps	Signal	AM	25.6	C	26.2	C	0.6	None
		PM	19.1	B	20.9	B	1.8	None
4. Clairemont Mesa Blvd / Kearny Villa Rd [e]	Signal	AM	25.9	C	27.0	C	1.1	None
		PM	42.2	D	44.8	D	2.6	None
5. Clairemont Mesa Blvd / Complex Dr [e]	Signal	AM	19.8	B	20.6	C	0.8	None
		PM	16.8	B	18.9	B	2.1	None
6. Clairemont Mesa Blvd / Overland Ave [e]	Signal	AM	50.8	D	52.3	D	1.5	None
		PM	52.1	D	53.5	D	1.4	None
7. Clairemont Mesa Blvd / Ruffin Rd [e]	Signal	AM	46.7	D	50.6	D	3.9	None
		PM	**61.6**	**E**	**65.1**	**E**	**3.5**	**Cumulative**
8. Clairemont Mesa Blvd / Project Access Dwy [f]	Signal	AM	DNE	DNE	16.3	B	NA	None
		PM	DNE	DNE	21.6	C	NA	None
9. Clairemont Mesa Blvd / Murphy Canyon Rd [e]	Signal	AM	30.2	C	32.9	B	2.7	None
		PM	46.8	D	**58.4**	**E**	**11.6**	**Cumulative**
10. Clairemont Mesa Blvd / I-15 SB Ramps	Signal	AM	28.6	C	29.7	C	1.1	None
		PM	28.7	C	29.0	C	0.3	None
11. Clairemont Mesa Blvd / I-15 SB Ramps	Signal	AM	31.8	C	39.2	D	7.4	None
		PM	19.9	B	22.0	C	2.1	None
12. Lightwave Ave / Overland Ave	Signal	AM	23.5	C	23.6	C	0.1	None
		PM	28.1	C	28.6	C	0.5	None
13. Ruffin Rd / SR 52 WB Ramps	Signal	AM	22.3	C	23.1	C	0.8	None
		PM	29.7	C	30.4	C	0.7	None
14. Ruffin Rd / SR 52 EB Ramps	Signal	AM	16.5	B	17.1	B	0.6	None
		PM	52.4	D	54.4	D	2.0	None

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TABLE 10–1 (CONTINUED)
LONG-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Year 2035 Without Project		Year 2035 With Project		Δ Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS		
15. Ruffin Rd / Kearny Villa Rd	Signal	AM	15.5	B	15.7	B	0.2	None
		PM	24.0	C	25.6	C	1.6	None
16. Ruffin Rd / Chesapeake Dr	Signal	AM	16.1	B	17.5	B	1.4	None
		PM	25.5	C	26.6	B	1.1	None
17. Ruffin Rd / Hazard Wy	Signal	AM	9.7	A	10.5	A	0.8	None
		PM	16.1	B	17.5	B	1.4	None
18. Ruffin Rd / Farnham St	Signal	AM	11.4	B	11.5	B	0.1	None
		PM	23.0	C	23.6	C	0.6	None
19. Ruffin Rd / Project Access Dwy [f]	Signal	AM	DNE	DNE	9.9	B	NA	None
		PM	DNE	DNE	10.1	A	NA	None
20. Ruffin Rd / Ruffin Ct	Signal	AM	25.6	C	29.1	C	3.5	None
		PM	31.2	C	44.9	D	13.7	None
21. Ruffin Rd / Spectrum Center Blvd	Signal	AM	19.0	B	19.0	B	0.0	None
		PM	38.3	D	38.3	D	0.0	None
22. Ruffin Rd / Balboa Ave	Signal	AM	58.8	E	60.4	E	1.6	None
		PM	**60.8**	**E**	**66.4**	**E**	**5.6**	**Cumulative**
23. Viewridge Ave / Balboa Ave	Signal	AM	30.4	C	33.1	C	2.7	None
		PM	52.8	D	**57.9**	**E**	**5.1**	**Cumulative**
24. Ruffin Ct / Project Dwy #3 [f]	MSSC	AM	DNE	DNE	14.0	B	NA	None
		PM	DNE	DNE	21.2	C	NA	None
25. Ruffin Ct / Project Dwy #4 [f]	MSSC	AM	DNE	DNE	12.9	B	NA	None
		PM	DNE	DNE	14.6	B	NA	None

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Increase in delay due to project traffic.
d. MSSC – Minor Street Stop Controlled intersection. Minor street left turn delay is reported.
e. These intersections are part of a coordinated signal system
f. The project driveways are only analyzed in the "with Project" scenarios.

SIGNALIZED		UNSIGNALIZED	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Note:

DNE – Does not exist.
Bold indicates a significant impact.

TABLE 10–2
LONG-TERM STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	Year 2035 Without Project			Year 2035 With Project			Δ [e] V/C	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
Clairemont Mesa Boulevard										
SR 163 NB Ramps to Kearny Villa Rd	6-ln Prime	60,000	34,000	B	0.567	35,070	C	0.585	0.018	None
Kearny Villa Rd to Complex Dr	6-ln Major	50,000	29,100	C	0.582	30,170	C	0.603	0.021	None
Kearny Villa Rd to Overland Ave	6-ln Major	50,000	28,200	C	0.564	29,270	C	0.585	0.021	None
Overland Ave to Ruffin Rd	6-ln Major	50,000	26,200	B	0.524	28,540	C	0.571	0.047	None
Ruffin Rd to Project Access Dwy	6-ln Major	50,000	28,100	C	0.562	30,440	C	0.609	0.047	None
Project Access Dwy to Murphy Cnyn Rd	6-ln Major	50,000	32,500	C	0.650	42,760	D	0.855	0.205	None
Murphy Canyon Rd to I-15	6-ln Major	50,000	37,100	C	0.742	41,810	D	0.836	0.094	None
Lightwave Avenue										
Overland Ave to Ruffin Rd	4-Lane Col	30,000	15,200	C	0.507	15,530	C	0.518	0.011	None
Ruffin Court										
Ruffin Rd to Project Dwy	2-Lane Col	15,000	3,400	A	0.227	6,640	B	0.443	0.216	None
Balboa Avenue										
Ponderosa Ave to Ruffin Rd	4-lane Major	40,000	36,500	E	0.913	36,670	E	0.917	0.004	None [f]
Ruffin Rd to Viewridge Ave	6-lane Prime	60,000	27,200	B	0.453	27,530	B	0.459	0.006	None
Viewridge Ave to I-15	6-lane Prime	60,000	46,600	C	0.777	47,590	C	0.793	0.016	None
Viewridge Avenue										
South of Ruffin Ct	2-Lane Col	15,000	8,600	C	0.573	9,260	C	0.617	0.044	None
North of Balboa Ave	2-Lane Col	15,000	19,600	F	1.307	20,260	F	1.351	0.044	None [g]

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TABLE 10–2 (CONTINUED)
LONG-TERM STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	Year 2035 Without Project			Year 2035 With Project			Δ [e] V/C	Impact Type
			ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
Ruffin Road										
SR 52 to Kearny Villa Rd	4-Lane Major	40,000	22,100	C	0.553	23,010	C	0.575	0.023	None
Kearny Villa Rd to Chesapeake Dr	4-Lane Col	30,000	18,400	C	0.613	19,310	C	0.644	0.031	None
Chesapeake Dr to Hazard Wy	4-Lane Col	30,000	16,900	C	0.563	17,810	C	0.594	0.031	None
Hazard Wy to Farnham St	4-Lane Col	30,000	16,800	C	0.560	17,710	C	0.590	0.030	None
Farnham St to Clairemont Mesa Blvd	4-Lane Col	30,000	18,600	C	0.620	19,510	C	0.650	0.030	None
Clairemont Mesa Blvd to Project Dwy	4-Lane Col	30,000	19,600	C	0.653	22,660	D	0.755	0.102	None
Project Dwy to Ruffin Ct	4-Lane Col	30,000	20,400	D	0.680	23,460	D	0.782	0.102	None
Ruffin Crt to Spectrum Ctr Blvd	4-Lane Col	30,000	22,700	D	0.757	23,280	D	0.776	0.019	None
Spectrum Ctr Blvd to Balboa Ave	4-Lane Col	30,000	28,300	E	0.943	28,880	E	0.963	0.020	None

Footnotes:

a. Capacities based on City of San Diego Roadway Capacity table.
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Increase in V/C ratio due to project traffic.
f. Not a significant impact since the increase in V/C ratio is within the allowable limit.
g. Not a significant impact since the arterial analysis indicates LOS C or better operations during the peak hours. See text for further explanation.

General Note:

Bold indicates a significant impact.

TABLE 10-3
LONG-TERM (YEAR 2035) FREEWAY MAINLINE OPERATIONS

YEAR 2035 WITHOUT PROJECT

Freeway Segment	Dir.	# of Lanes	Hourly Capacity [a]	ADT [b]	% K [c]		% D [c]		Truck Factor [d]	Without Project Peak Hour Volume [e]		V/C [f]		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
Interstate 15															
SR 52 Connector to	NB	4	8,000	163,200	0.0813	0.0792	0.4735	0.4678	0.9627	6,526	6,281	0.816	0.785	D	C
Clairemont Mesa Blvd	SB	4	8,000		0.0813	0.0792	0.5265	0.5322		7,256	7,145	0.907	0.893	D	D
Clairemont Mesa Blvd to	NB	4 + 1	9,200	209,300	0.0813	0.0792	0.4735	0.4678	0.9627	8,369	8,055	0.910	0.876	D	D
Balboa Ave	SB	4 + 1	9,200		0.0813	0.0792	0.5265	0.5322		9,306	9,164	1.012	0.996	F(0)	E
Balboa Ave to Aero Dr	NB	4 + 1	9,200	222,400	0.0813	0.0792	0.4735	0.4678	0.9627	8,893	8,559	0.967	0.930	E	E
	SB	4 + 1	9,200		0.0813	0.0792	0.5265	0.5322		9,889	9,737	1.075	1.058	F(0)	F(0)
SR 163															
SR 52 Connector to	NB	4 + 1	9,200	167,600	0.0858	0.0923	0.4792	0.4931	0.9717	7,092	7,850	0.771	0.853	C	D
Clairemont Mesa Blvd	SB	4 + 1	9,200		0.0858	0.0923	0.5208	0.5069		7,707	8,070	0.838	0.877	D	D
Clairemont Mesa Blvd to	NB	4 + 1	9,200	174,000	0.0858	0.0923	0.4792	0.4931	0.9717	7,362	8,150	0.800	0.886	D	D
Balboa Ave	SB	4 + 1	9,200		0.0858	0.0923	0.5208	0.5069		8,002	8,378	0.870	0.911	D	D
SR 52															
SR 163 to Kearny Villa	WB	3	6,000	85,100	0.0996	0.0903	0.5962	0.4246	0.9690	5,215	3,367	0.869	0.561	D	B
Rd	EB	3	6,000		0.0996	0.0903	0.4038	0.5754		3,532	4,563	0.589	0.761	B	C
Kearny Villa Rd to I-15	WB	2	4,000	95,900	0.0996	0.0903	0.5962	0.4246	0.9690	5,877	3,795	1.469	0.949	F(3)	E
	EB	2	4,000		0.0996	0.0903	0.4038	0.5754		3,980	5,142	0.995	1.286	E	F(1)

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.
b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.
c. Year 2035 Without Project ADT.
d. Peak Hour Percentage (K) and Direction Split (D) from CALTRANS, 2009
e. Truck Factor from "2010 Annual Average Daily Truck Traffic on the California State Highway System".
f. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
g. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 10-3
LONG-TERM (YEAR 2035) FREEWAY MAINLINE OPERATIONS

YEAR 2035 WITH PROJECT

Freeway Segment	Dir.	# of Lanes [a]	Hourly Cap [b]	No Project						Project Traffic [d]		With Project						Δ V/C		Impact Type
				Peak Hour Volume [c]		V/C		LOS				Peak Hour Volume		V/C		LOS				
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
Interstate 15																				
SR 52 Connector to Clairemont Mesa Blvd	NB	4	8,000	6,526	6,281	0.816	0.785	D	C	21	51	6,547	6,332	0.818	0.791	D	C	0.003	0.006	None
	SB	4	8,000	7,256	7,145	0.907	0.893	D	D	29	30	7,285	7,175	0.911	0.897	D	D	0.004	0.004	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	8,369	8,055	0.910	0.876	D	D	130	133	8,499	8,188	**0.924**	0.890	**E**	D	**0.014**	0.014	**Cumulative**
	SB	4 + 1	9,200	9,306	9,164	1.012	0.996	F(0)	E	94	230	9,400	9,394	**1.022**	**1.021**	**F(0)**	**F(0)**	**0.010**	**0.025**	**Cumulative**
Balboa Ave to Aero Dr	NB	4 + 1	9,200	8,893	8,559	0.967	0.930	E	E	165	169	9,058	8,728	**0.985**	**0.949**	**E**	**E**	**0.018**	**0.018**	**Cumulative**
	SB	4 + 1	9,200	9,889	9,737	1.075	1.058	F(0)	F(0)	119	291	10,008	10,028	**1.088**	**1.090**	**F(0)**	**F(0)**	**0.013**	**0.032**	**Cumulative**
SR 163																				
SR 52 Connector to Clairemont Mesa Blvd	NB	4 + 1	9,200	7,092	7,850	0.771	0.853	C	D	4	10	7,096	7,860	0.771	0.854	C	D	0.000	0.001	None
	SB	4 + 1	9,200	7,707	8,070	0.838	0.877	D	D	6	6	7,713	8,076	0.838	0.878	D	D	0.001	0.001	None
Clairemont Mesa Blvd to Balboa Ave	NB	4 + 1	9,200	7,362	8,150	0.800	0.886	D	D	29	30	7,391	8,180	0.803	0.889	D	D	0.003	0.003	None
	SB	4 + 1	9,200	8,002	8,378	0.870	0.911	D	D	21	51	8,023	8,429	0.872	0.916	D	D	0.002	0.006	None
SR 52																				
SR 163 to Kearny Villa Rd	WB	3	6,000	5,215	3,367	0.869	0.561	D	B	17	41	5,232	3,408	0.872	0.568	D	B	0.003	0.007	None
	EB	3	6,000	3,532	4,563	0.589	0.761	B	C	23	24	3,555	4,587	0.593	0.765	B	C	0.004	0.004	None
Kearny Villa Rd to I-15 [e]	WB	2	4,000	5,877	3,795	1.469	0.949	F(3)	E	9	9	5,886	3,804	1.471	0.951	F(3)	E	0.002	0.002	None [e]
	EB	2	4,000	3,980	5,142	0.995	1.286	E	F(1)	6	15	3,986	5,157	0.997	1.289	E	F(1)	0.002	0.004	None [e]

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR 163.

b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.

c. Year 2035 "Without Project" peak hour traffic volumes from the previous page.

d. Entire Project traffic volumes.

e. Not an impact since the increase in V/C ratio is less than the threshold (0.005 for LOS F and 0.010 for LOS E).

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

General Notes:

Bold indicates a significant impact.

TABLE 10-4
LONG-TERM (YEAR 2035) RAMP METER ANALYSIS

Location/Condition	Peak Hour	Demand D [a] (veh/hr/ln)	Most Restrictive Meter Rate [b] (R) (veh/hr/ln)	Calculated			Maximum Observed [f]		
				Excess Demand [c] E (veh/hr/ln)	Delay [d] (min/ln)	Queue [e]	Delay (Min)	Queue	
								Veh/Ln	Feet
WB Clairemont Mesa Boulevard to NB SR 163			12% Reduction to volumes in SOV lanes due to HOV lane				1 SOV+1 HOV		
Year 2035 No Project - SOV	PM	757	593	164	17	4,095	0	0	0
Year 2035 No Project - HOV	PM	103	593	0	0	0	0	0	0
Year 2035 With Project - SOV	PM	766	593	173	17	4,315	0	0	0
Year 2035 With Project - HOV	PM	104	593	0	0	0	0	0	0
WB Clairemont Mesa Boulevard to SB SR 163							2 SOV		
Year 2035 No Project	PM	600	514	86	10	2,150	0	0	0
Year 2035 With Project	PM	626	514	112	13	2,788	0	0	0
EB Clairemont Mesa Boulevard to NB I-15							2 SOV		
Year 2035 No Project	PM	495	238	257	65	6,425	3	24	600
Year 2035 With Project	PM	521	238	283	71	7,063	4	26	650
EB Clairemont Mesa Boulevard to SB I-15			11% Reduction to volumes in SOV lanes due to HOV lane				2 SOV+1 HOV		
Year 2035 No Project - SOV	PM	507	312	195	38	4,883	25	299	7,475
Year 2035 No Project - HOV	PM	125	312	0	0	0	0	0	0
Year 2035 With Project - SOV	PM	610	312	298	57	7,441	**38**	**456**	**11,400**
Year 2035 With Project - HOV	PM	151	312	0	0	0	0	0	0
EB Balboa Avenue to SB I-15			14% Reduction to volumes in SOV lanes due to HOV lane				2 SOV+1 HOV		
Year 2035 No Project - SOV	PM	711	827	339	55	8,481	15	112	2,800
Year 2035 No Project - HOV	PM	232	248	0	0	0	0	0	0
Year 2035 With Project - SOV	PM	737	858	365	59	9,136	16	121	3,025
Year 2035 With Project - HOV	PM	240	257	0	0	0	0	0	0

Footnotes:

a. Demand "D" is the traffic that desires to enter the freeway at this on-ramp during the peak hour.
b. Meter Rate "R" is the *most restrictive* rate at which the ramp meter (signal) discharges traffic on to the freeway.
c. Excess Demand "E" is the difference between the Demand and the Peak Hour Flow.
d. Delay in minutes per lane experienced by each vehicle, calculated as the ratio of the Excess Demand and the Peak Hour Flow in one minute.
e. Queue is calculated as 25 feet per vehicle (E)
f. Estimated Delay and Queue based on current field observations.

General Notes:
Bold indicates a significant impact.

10.3.5 *ILV Operations*

Table 10-5 summarizes the Year 2035 without Project ILV calculations for the freeway interchanges within the study area. As seen in this table, the following study area interchange intersections are calculated to operate at over capacity:

- Clairemont Mesa Boulevard / SR–163 NB intersection - Over capacity during the AM peak hour.
- Clairemont Mesa Boulevard / I–15 SB intersection - Over capacity during both the AM and PM peak hours.
- Clairemont Mesa Boulevard / I–15 NB intersection - Over capacity during the AM peak hour.
- Ruffin Road / SR–52 WB intersection - Over capacity during the PM peak hour.

The Year 2035 without Project ILV analysis worksheets are included in *Appendix J***.**

TABLE 10-5
YEAR 2035 ILV OPERATIONS

Intersection	Peak Hour	Year 2035 Without Project		Year 2035 With Project	
		Operating Level (ILV / Hour)	Capacity	Operating Level (ILV / Hour)	Capacity
4. Clairemont Mesa Boulevard / SR-163 NB Ramps	AM	1,617	Over	1,663	Over
	PM	1,190	Under	1,145	Under
10. Clairemont Mesa Boulevard / I-15 SB Ramps	AM	2,265	Over	2,391	Over
	PM	2,010	Over	2,270	Over
11. Clairemont Mesa Boulevard / I-15 NB Ramps	AM	1,735	Over	1,817	Over
	PM	1,305	Near	1,374	Near
13. Ruffin Road / SR-52 WB Ramps	AM	1,130	Under	1,156	Under
	PM	1,630	Over	1,680	Over
14. Ruffin Road / SR-52 EB Ramps	AM	1,110	Under	1,136	Under
	PM	1,420	Near	1,441	Near

General Note:

a. CAPACITY is shown as UNDER capacity, NEAR capacity or OVER capacity:
Under *Capacity* = <1200 ILV/Hour
Near Capacity = >1200 but < 1500 ILV/Hour
Over Capacity **=** >1500 ILV/Hour

b. The Clairemont Mesa Boulevard / SR-163 SB ramps intersection is not analyzed since it is not signalized.

10.4 Year 2035 + Project

10.4.1 *Intersection Analysis*

Table 10-1 summarizes the Year 2035 with Entire Project peak hour intersection operations. As seen in *Table 10-1*, the following four intersections are calculated to operate at LOS E :

- Clairemont Mesa Boulevard / Ruffin Road (LOS E during the PM peak hour).
- Clairemont Mesa Boulevard / Murphy Canyon Road (LOS E during the PM peak hour)
- Balboa Avenue / Ruffin Road (LOS E during the PM peak hour).
- Balboa Avenue / Viewridge Avenue (LOS E during the PM peak hour).

The Year 2035 with Project peak hour analysis worksheets are included in ***Appendix K.***

10.4.2 *Segment Operations*

Table 10-2 summarizes the Year 2035 segment operations. As seen in *Table 10-2*, the following segments are calculated to operate at LOS E or worse:

- Viewridge Avenue: North of Balboa Avenue (LOS F)
- Balboa Avenue: Ponderosa Avenue to Ruffin Road (LOS E)

The segment of View Ridge Avenue north of Balboa Avenue is calculated to operate at LOS F in the Year 2035 without and with the project. The City allows a determination of no significance if the following three conditions are met:

(1) The roadway is built to its ultimate classification per the Kearny Mesa Community Plan,

(2) LOS D or better operations are calculated during the peak hours at the signalized intersections at each end of the study segment, and

(3) LOS D or better operations are calculated using the HCM peak hour arterial analysis method.

The Ruffin Road / Ruffin Court Road intersection at the north end of this segment is calculated to operate at LOS D or better during the AM and PM peak hours. The View Ridge Avenue / Balboa Avenue intersection is calculated to operate at LOS E with the addition of project traffic. However, with the proposed mitigation, this intersection is calculated to operate at LOS D during the AM and PM peak hours (*Table 14-1*).

Table 10-6 summarizes the results of the arterial analysis along the View Ridge Avenue / Ruffin Court between Ruffin Road and Balboa Avenue. As seen in *Table 10-5*, in the Year 2035 with the project, the subject segment of View Ridge Avenue is calculated to operate at LOS C or better in both directions during both AM and PM peak hours.

(1) View Ridge Avenue is built to its ultimate classification per the Kearny Mesa Community Plan.

(2) The two intersections on either end of this roadway segment are calculation to operate at LOS D or better.

(3) LOS D or better operations are calculated using the HCM peak hour arterial analysis method.

Hence, the project would not have a significant cumulative impact on the segment of View Ridge Avenue North of Balboa Avenue.

Appendix K contains the Year 2035 with Project peak hour arterial analysis worksheets.

TABLE 10-6
YEAR 2035 WITH PROJECT
ARTERIAL OPERATIONS – VIEWRIDGE AVENUE

Direction	AM Peak Hour		PM Peak Hour	
	Travel Speed (mph)	**LOS**	**Travel Speed (mph)**	**LOS**
Northbound	22.0	C	19.5	C
Southbound	18.5	C	24.7	B

The increase in the V/C ratio due to the project traffic is less than 0.01 on the Balboa Avenue segment. Therefore, the project does not have a significant cumulative impact on this segment.

Based on the above discussion, the project does not have any long-term segment impacts.

10.4.3 *Freeway Mainline Analysis*

Table 10-3 summarizes the Year 2035 with project freeway mainline operations. As seen in *Table 10-3*, with the addition of the entire project traffic, the following freeway segments are calculated to continue to operate at LOS E or worse:

- **I-15:** Clairemont Mesa Boulevard to Balboa Avenue (NB - LOS E in the AM peak hour and SB - LOS F(0) in the AM and PM Peak hour)
- **I-15:** Balboa Avenue to Aero Drive (NB - LOS E in the AM and PM peak hours and SB - LOS F(0) in the AM and PM Peak hour)
- **SR 52:** Kearny Villa Road to I-15 (WB - LOS E in the AM peak hour and EB LOS E in the AM peak hour and LOS F(1) in the PM peak hour)

The project results in a significant cumulative impact on the two I-15 freeway segments. However, the increase in V/C ratio on the SR 52 segment is 0.002, which is less than the City of San Diego

significance criteria that allows an increase in V/C ratio of 0.005. Hence, the project does not have a significant cumulative impact on the subject SR 52 freeway segment.

10.4.4 *Freeway Ramp Meter Analysis*

Table 10-4 summarizes the Year 2035 With project ramp meter operations. As seen in *Table 10-4*, with the addition of the Entire Project traffic, using the most restrictive discharge rates obtained from Caltrans, the results show:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 71 minutes with a 283-vehicle, or a 7,063 -foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 57 minutes with a 298-vehicle, or a 7,441-foot long queue.
- Balboa Avenue / SB I-15 On-Ramp: Delay of 59 minutes with a 365-vehicle, or a 9,136-foot long queue.

Comparing the calculated values to the maximum observed existing values, with the addition of the Entire Project traffic, the proportionate delays and queues are estimated to be:

- Clairemont Mesa Boulevard / NB I-15 On-Ramp: Delay of 4 minutes with a 26-vehicle, or a 650-foot long queue.
- Clairemont Mesa Boulevard / SB I-15 On-Ramp: Delay of 38 minutes with a 456-vehicle, or a 11,400-foot longqueue.
- Balboa Avenue / SB I-15 On-Ramp: Queue: Delay of 16 minutes with a 21-vehicle, or a 3,025-foot long queue.

As seen above, based on field observations, the estimated delays with the addition of the Entire Project traffic is over 15 minutes at the Clairemont Mesa Boulevard / SB I-15 On-Ramp and the increase in delay due to the project traffic is 15 minutes. Therefore, the project has a cumulative impact at this Ramp Meter location. At the Balboa Avenue / SB I-15 On-Ramp, even though the total delay with project traffic is 21 minutes (over 15 minutes), the project contributes only 1 minute towards this delay, which is less than the allowable 2 minutes. Therefore, the project does not have a significant cumulative impact at this ramp.

10.4.5 *ILV Operations*

Table 10-5 summarizes the Year 2035 with Project ILV calculations for the freeway interchanges within the study area. As seen in this table, the following study area interchange intersections are calculated to operate at over capacity with the addition of the Entire Project traffic:

- Clairemont Mesa Boulevard / SR–163 NB intersection - Over capacity during the AM peak hour.
- Clairemont Mesa Boulevard / I–15 SB intersection - Over capacity during both the AM and PM peak hours.
- Clairemont Mesa Boulevard / I–15 NB intersection - Over capacity during the AM peak hour.

- Ruffin Road / SR–52 WB intersection - Over capacity during the PM peak hour.

The Year 2035 with Project ILV analysis worksheets are included in *Appendix K***.**

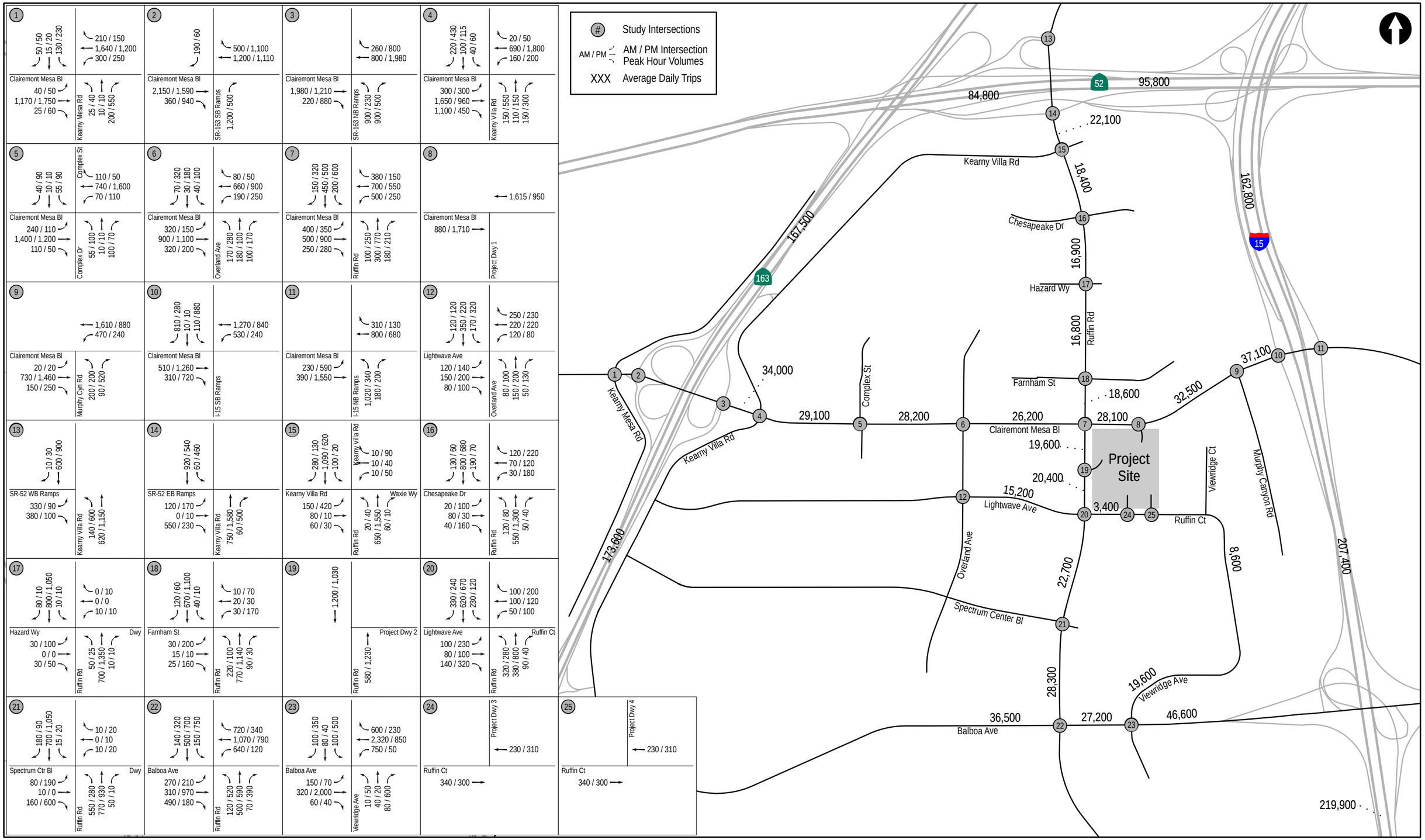

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Figure 10-1

Year 2035 Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

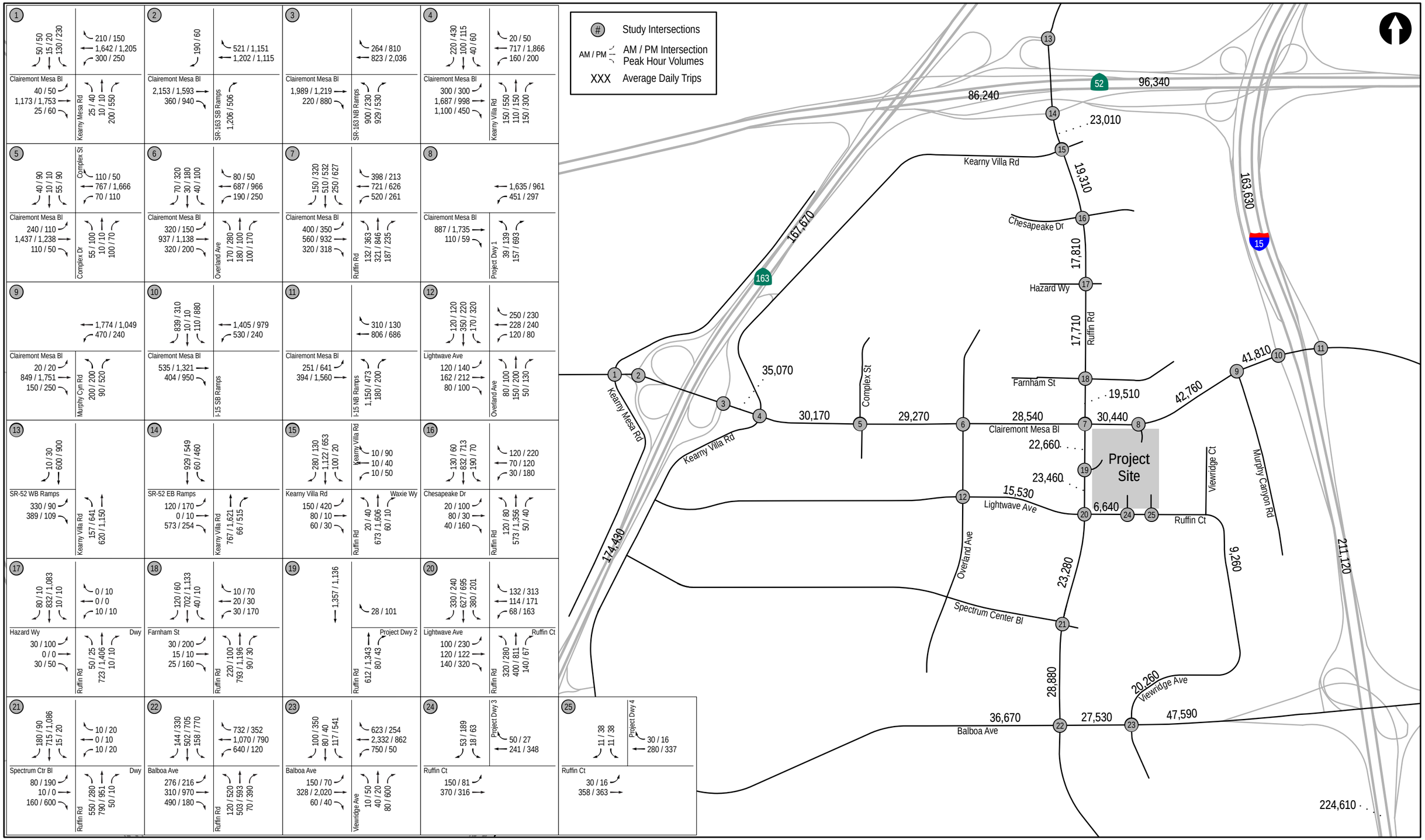

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Figure 10-2

Year 2035 with Project Traffic Volumes

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

11.0 ACCESS, PARKING, EVALUATION OF ON-SITE CIRCULATION AND COMMUNITY PLAN TRAFFIC

The following paragraphs address access, parking, and on-site circulation.

11.1 Project Access Driveways

Currently, the site is served by the following access driveways:

- *Clairemont Mesa Boulevard* - One right-in / right-out only access located approximately 330 feet east of Ruffin Road on Clairemont Mesa Road serves the site. The project proposes to close this access and replace it with a warranted signalized access to the east.
- *Ruffin Road* - Two driveways are currently provided on Ruffin Road. The first is a right-in / right-out only access located approximately 465 feet south of Clairemont Mesa Road. It is proposed to relocate this driveway further south. The second is a right-turn outbound only driveway approximately 130 feet north of Ruffin Court. A "No Entry" sign restricts entry at this driveway. This driveway will be eliminated.
- *Ruffin Court* - One driveway is currently provided at the eastern boundary of the site.

The following five driveways are proposed to serve the project site.

11.1.1 *Driveway #1 – Clairemont Mesa Boulevard*

Approximately 66% of the project traffic is expected to access the project site via Clairemont Mesa Boulevard, including 55% east of the project site from I-15 and another 11% west of the project site. Hence, it is proposed to provide a signalized access at the eastern boundary of the project site on Clairemont Mesa Boulevard, approximately 760 feet (centerline-to-centerline) east of Ruffin Road. Based on the forecasted volumes, dual WB left-turn lanes and an EB right-turn lane would be adequate to serve the project.

11.1.2 *Driveway #2 – Ruffin Road (Emergency Department Access)*

It is proposed to close the two existing driveways on Ruffin Road and provide one right-in / right-out only access driveway to serve the project.

An access driveway is proposed to be located approximately 540 feet south of Clairemont Mesa Boulevard. This driveway will provide right-in / right-out only access on Ruffin Road for ambulance access and access to the emergency room. Patients and ambulances accessing the Emergency Department from the north would make a U-turn at the Ruffin Court signal and approach the Ruffin Road access from the south.

11.1.3 *Driveway #3 – Ruffin Court*

The second driveway on Ruffin Court is proposed with direct access to the parking structure, at the southwestern corner of the parking structure.

11.1.4 *Driveway #4 – Ruffin Court*

The existing full access driveway at the eastern boundary of the site will serve as the third driveway on Ruffin Court. This driveway will also provide access to the County owned Polinsky Child Services Center adjacent to the site, to the east.

11.1.5 *Driveway #5 Loading Docks – Ruffin Court*

The first of the three driveways on Ruffin Court is proposed to serve the loading docks, the SDG&E yard and the Tech docks. The loading docks will serve the trucks delivering hospital supplies and removing waste. CT Scan labs will be available at the hospital. The Tech docks will be used to park mobile CT Scan and other equipment when needed, to accommodate excess seasonal demand. There will be no daily traffic to the Tech Docks either by trucks or patient vehicles. Generally, this equipment is needed infrequently and when needed, will be parked at the Project for a few weeks at a time. A sign indicating that this access is for "Deliveries" only, will be posted at the driveway entrance

11.2 Aligning Project Driveways with Existing Cross-streets

11.2.1 *Driveway #4 – Ruffin Court*

Driveway #4 on Ruffin Court is located just west of Greencraig Way. Greencraig Way is located outside of the project's eastern property line. Therefore it is not possible to align this driveway with Greeencraig Way.

11.2.2 *Driveway #5 – Ruffin Court*

Kaiser's Capital Projects team did examine the possibility of aligning the loading docks / service entrance with Greencraig Lane. However, it was determined that any other alternative would potentially change the Hospital Support Buildings (HSB) internal functionality, footprint, and building heights (Phase I and II) for the following reasons:

1. The close proximity of the Diagnostic & Treatment (D&T) to the Hospital Support Building (HSB) is the key to allowing the clinical flow that crosses between the inpatient and outpatient environments.
2. The more the two separate. the less feasible the integration of staff and services.
3. As proposed, the scheme is connected on a corner only. As that corner linkage is stretched it becomes more complicated to plan.
4. The imaging mobile units (MRI and PET Scan) located within the Tech Dock will become increasingly more difficult to access from D&T areas and, shifting the HSB building eastward would further encroach into pedestrian paths between the HSB and parking structure.

One alternative proposal is to add an additional "exit only" driveway adjacent to the northeast corner of Ruffin Court and Ruffin Road. .

1. The general access to lower Service Dock handles traffic flow sufficiently.

2. The Tech Dock access is still feasible but tighter than the originally "proposed driveway" location.
3. However, the O2 and Fuel Truck access is not feasible without the addition of an "exit only" driveway to the west to accommodate exiting, as opposed to backing-up across the service traffic flow. That is an undesirable condition as it would potentially cause trucks exiting the lower Service Dock to have to stop on the ramp and then re-start going uphill.

It may be noted that the subject driveway is for the use of the Tech docs, O2 and fuel tanks, loading docks including trash pick-up and the use of this driveway is minimal especially during the peak hours as demonstrated below:

4. *Tech Docks* - Traffic to the Tech docs is infrequent occurring only about four times a year. The trailers are brought in and dropped off and parked for a couple of weeks as needed and when they are no longer required, the trucks return to pick-up the trailers.
5. *O2 and Fuel Tanks* - Trucks bring oxygen and fuel for the O2 and Fuel tanks respectively and refill the O2 and fuel during off-peak hours. O2 tanks will be refilled twice a month
6. *Loading Docks* - Supplies to the hospital are generally delivered during off-peak hours. The frequency of trucks to the energy center / loading docks is approximately 25 to 30 trucks a day.
7. *Trash* – Trash is generally picked-up during off-peak hours. Medical Waste / Sanipak pick-ups are approximately three times daily.

Thus, peak hour traffic to and from the loading docks would be minimal. The peak hour volume of traffic on northbound Greencraig Lane is less than 50 trips (right and left-turn together). A sign indicating that the driveway is for the use of deliveries to the hospital only will be prominently displayed at the driveway entrance.

Therefore, under the circumstances explained above, It is anticipated that driveway as proposed will function adequately.

11.3 Parking

The proposed project is a 450-bed hospital and a 180,000 SF Medical Office Support Building. ***Table 11-1*** summarizes the minimum required and proposed parking, by phase. As explained previously, Phase I development includes a 321-bed hospital and a 75,000 SF MOB. Phase II will add 129 beds and 105,000 SF MOB.

11.3.1 *Minimum Requirement*

PHASE I

As seen in *Table 11-1*, per Chapter 14: General Regulations, *City of San Diego Municipal Code*, the minimum parking requirement is 642 general parking spaces for the hospital and 300 spaces for the MOB for a total of 942 vehicular parking spaces in the Project Phase I. In addition, a minimum of 19 accessible, 22 bicycle and 19 motorcycle spaces are required.

PHASE II

As seen in *Table 11-1*, the minimum parking requirement is 258 general parking spaces for the hospital and 420 spaces for the MOB for a total of 678 vehicular parking spaces in Project Phase II. In addition, a minimum of 13 accessible, 18 bicycle and 13 motorcycle spaces are required.

TABLE 11-1
PARKING SUMMARY

Description	City of San Diego Rates [a]	Phase I		Phase II		Total Parking Spaces
		Size	Spaces	Size	Spaces	
Minimum Parking Required						
Hospital						
Vehicle	2 spaces per bed	321 Beds	642	129 Beds	258	**900**
Accessible	2 % of Auto Minimum	642 Spaces	13	258 Spaces	5	**18**
Bicycle	2 % of Auto Minimum	642 Spaces	13	258 Spaces	5	**18**
Motorcycle	2 % of Auto Minimum	642 Spaces	13	258 Spaces	5	**18**
Medical Office Building						
Vehicle	4 spaces per KSF	75 KSF [b]	300	105 KSF	420	**720**
Accessible	2 % of Auto Minimum	300 Spaces	6	420 Spaces	8	**14**
Bicycle	3 % of Auto Minimum	300 Spaces	9	420 Spaces	13	**22**
Motorcycle [b]	2 % of Auto Minimum	300 Spaces	6	420 Spaces	8	**14**
Total Minimum Parking Required						
Vehicle			**942**		**678**	**1,620**
Accessible			**19**		**13**	**32**
Bicycle			**22**		**18**	**40**
Motorcycle			**19**		**13**	**32**
Parking Proposed						
Vehicle			**1,459**		**1,134**	**2,593**
Accessible			**60**		**93**	**153**
Bicycle			**29**		**23**	**52**
Motorcycle			**29**		**23**	**52**
Excess Vehicle Parking Available			**517**		**259**	**973**

Footnotes:

a. Minimum parking requirement obtained from Table 142-05F, Chapter 14: General Regulations, *San Diego Municipal Code.*
b. KSF – 1,000 square feet.
c. 2% of required vehicular spaces, 300 spaces in Phase 1 and 420 spaces in Phase 2 (see required minimum spaces for Medical Office Building.

TOTAL MINIMUM PARKING REQUIRED

For the entire project, the total minimum parking requirement is 900 general parking spaces for the hospital and 720 spaces for the MOB for a total of 1,620 vehicular parking spaces in Project Phase II. In addition, a minimum of 32 accessible, 40 bicycle and 32 motorcycle spaces are required. Also, 40 bicycle lockers, and showers will be required.

11.3.2 *Parking Proposed*

PHASE I

In Phase I, the project proposes to provide 100 spaces in a surface lot at the northwest corner of the project site. Another 1,359 spaces will be provided in the parking structure at the southeast corner of the site, for a total of 1,459 auto spaces. In addition to the auto spaces, 60 accessible spaces, 29 bicycle and 29 motorcycle spaces will also be provided in Phase I.

PHASE II

In Phase II, the project proposes to provide an additional 1,134 spaces in the parking structure for a total of 2,593 auto spaces. The required number of spaces per the City of San Diego Municipal Code is 1,620. In addition to the auto spaces, 93 accessible spaces, 23 bicycle and 23 motorcycle spaces will also be provided in Phase II.

TOTAL PROPOSED PARKING

It is proposed to provide a total of 2,593 vehicular parking spaces in the parking structure and the surface lot adjacent to the Emergency Department, 973 spaces in excess of the minimum required 1,620 spaces. Thus, more than adequate vehicular parking is proposed. In addition, a total of 52 motorcycle parking spaces and 52 bicycle parking spaces and lockers will also be provided. It is also proposed to provide 153 accessible spaces, 121 in excess of the minimum required.

While the parking provided is in excess of the minimum required parking (there is no "maximum permitted" per LDC), it may be noted that during shift changes there is an overlap of employees and the sufficient parking has to be provided for the demand during the shift change that occur hourly and begin at 7:00 AM, and continue hourly until 11:00 AM and then again between 2:00 PM and 4:00 PM and so on as needed by each department. The "excess" parking spaces are also expected to accommodate peak parking demand based on Kaiser's experience at their various other facilities.

11.4 Evaluation of On-Site Circulation

11.4.1 *Proposed On-Site Vehicular and Pedestrian Circulation*

The following internal roadways are proposed:

- The first is the road from Clairemont Mesa Boulevard to the parking structure / hospital main entrance. This road will generally have two lanes in each direction, except at Clairemont Mesa Boulevard where a northbound left–turn lane will be added to serve outbound traffic. This roadway will be utilized by both employees and the public.

- At the first internal intersection of this roadway, southbound traffic will not be stopped. Traffic on the road along the north of the parking structure will be stopped. This will ensure that traffic entering the site will not back-up into the signalized intersection.

- A secondary road branches out from the above roadway and wraps around the Parking structure. This roadway will provide access to the Polinsky Center to the east and the parking structure and serve as an emergency fire access.

- A second road will be provided from the Emergency Department (ED) entrance to the ED and the surface parking lot at the northwest corner of the site.

- A third access roadway from the loading dock driveway on Ruffin Court to the O2 & fuel tanks, the Tech docks and the loading docks will be used only by truck traffic and employees that work in that area. This is not for public use.

- As seen in *Figures 2-1* and *2-2*, several pedestrian paths will also be provided on-site, connecting various on-site facilities.

11.4.2 *On-Site East / West Connection*

No internal vehicular connection is provided between the west (Ruffin Road) and the east (parking structure). Only pedestrian paths will be provided. During discussions with Kaiser, it was determined that based on their experience at other similar facilities, there is very little interaction between the Emergency Department (ED) and the parking structure. An adequate sized parking lot is proposed at the northwest corner of the site to serve the ED. Approximately 100 spaces will be provided at this parking lot. Family members of patients at the ED will be able to park at this surface lot for the duration of their stay at the ED and can pick-up their family member at the end of the visit. There is little need for this traffic to access the parking structure.

While it would be preferable for emergency vehicles to use the signalized access on Clairemont Mesa Boulevard to access the Emergency Department (ED), this would result in ambulance traffic mixing with patient traffic. As explained before, 66% of the project traffic is estimated to use this driveway and hence this driveway will have a large amount of traffic. Therefore, the ED traffic is separated from the patient /visitor traffic.

The other reason to provide an internal vehicular access between the east and west would be for patrons destined to the ED, who mistakenly enter the hospital at Clairemont Mesa Boulevard. Adequate signage will be provided to properly direct traffic to the ED, at the entrances to avoid such instances.

As a safety precaution and to maximize efficiency of their medical centers, Kaiser Permanente separates vehicle access by function as follows: member/employee, service and delivery, and emergency department visits. Non-ambulance emergency rooms visits are a minute percentage of total visits to Kaiser medical centers annually. Therefore, a number of medical center facilities have precluded onsite circulation between the main hospital entrance and the emergency department. There may be rare instances of disoriented visitors attempting to access the emergency department via the main hospital entrance. Should this occur in time of real emergency, there is internal building access from the main entrance to the emergency department. Again, these instances are extremely rare as all Kaiser Permanente facilities have highly visible way-finding signage directing members to the proper destination (in English and Spanish). This project will include way-finding signage along Clairemont Mesa Boulevard, Ruffin Road and Ruffin Court.

Thus, an internal vehicular access between the west (Ruffin Road) and the east (parking structure) is not provided.

11.4.3 *Emergency Department*

The configurations of two ambulance parking areas are adequate for arriving ambulances to turn and back into their parking spaces. The width provided in the southern parking area is also sufficient for ambulances to maneuver into the parking spaces.

As explained previously, the Emergency Storage will be located off of the entrance to the Emergency Department (ED) at Ruffin Road. This is a dedicated storage for disaster preparedness supplies. Access is limited to replacing expired supplies or during a major catastrophic event. The Master Sign Plan will include signs limiting both points of access as "Employee Access Only." The only traffic to this facility will be to stock supplies and during an emergency to access the supplies.

11.4.4 *Loading Docks*

Tech Docks - Inbound trucks have to head straight into the SDG&E Yard and Gas Tanks Area and back towards the east and north into the Tech docks. Outbound trucks will be able to pull forward and head to the street with no difficulty.

Loading Dock – Trucks: Inbound trucks will be able to turn and back into the loading docks. They have to pull forward to the west and then south, and back into the dock. Outbound trucks have to pull forward southwards and then back to the north before climbing the ramp to the street level. The configuration provided will allow these maneuvers.

SDG&E Yard and Gas Tanks Area – Trucks: Inbound trucks have to head straight into the Tech dock, and back towards the west into the SDG&E Yard / Gas Tanks Area. Outbound trucks (Figure 5) can exit directly onto the street.

11.5 Queuing Analysis

Near-Term and Long-Term queuing analyses were conducted at the three full movement project driveways to determine if the 95th percentile calculated queue lengths at the project driveway intersections will exceed the available storage, thus degrading the operations at the intersections. A calculated queue analysis at Project driveway #2 is not included since this intersection is a right-in / right-out only intersection. ***Table 11-2*** summarizes the results of this analysis for each "with Project" condition. One of the products of the peak hour intersection analysis is a queuing report that provides the 95th percentile queue lengths by lane in feet or number of vehicles.

11.5.1 *Existing + Project Calculated Queue Lengths*

As seen in *Table 11-2*, the calculated queue lengths for the Existing + Project Phase I and Existing + Entire project are less than the storage provided in the turn lanes at all intersections, except at the Clairemont Mesa Boulevard /Project Driveway #1 intersection. At this driveway, while it is true that the calculated queues in the northbound left and right-turn lanes are in excess of the storage

provided, the traffic will however, back-up on-site and not on public streets. Site constraints do not allow for any increase in onsite storage.

11.5.2 *Near-Term Calculated Queue Lengths*

The calculated queue lengths for the Near-Term + Project Phase I and the Near-Term + Entire project are less than the storage provided in the turn lanes at all intersections, except at the Clairemont Mesa Boulevard /Project Driveway #1 intersection. As explained above, while it is true that the calculated queues in the northbound left and right-turn lanes at this driveway are in excess of the storage provided, the traffic will however, back-up on-site and not on public streets. Site constraints do not allow for any increase in onsite storage.

11.5.3 *Long-Term (Year 2035) Calculated Queue Lengths*

The calculated queue lengths for the Year 2035 + Project are less than the storage provided in the turn lanes at all intersections, except at the Clairemont Mesa Boulevard /Project Driveway #1 intersection. As explained above, while it is true that the calculated queues in the northbound left and right-turn lanes at this driveway are in excess of the storage provided, the traffic will however, back-up on-site and not on public streets. Site constraints do not allow for any increase in onsite storage.

The queuing analysis worksheets are included in ***Appendix L-1.***

11.6 Community Plan Land Use Designation

The Kearny Mesa Community Plan adopted on August 6, 1992 by Resolution number R-280821 designation of M-1A, Industrial / Retail / Office and the Proposed Land Use designation is Institutional. ***Appendix L-2*** includes the City maps showing the current and proposed land use designations for the project site. As seen in the adopted Community Plan, the proposed project conforms to the adopted land use designation for the site.

TABLE 11-2
FORECASTED QUEUE IN FEET (95TH PERCENTILE)

Intersection	Movement	Available Storage Length (Feet)	Existing + Project				Near-Term				Long-Term	
			Existing + Project Phase I		Existing + Entire Project		Near-Term + Project Phase I		Near-Term + Entire Project		With Project	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Clairemont Mesa Boulevard / Project Dwy #1	WB Left to SB	300	160	120	190	190	130	120	240	190	300	180
	WB Through	>500	70	50	60	60	60	50	65	70	100	180
	NB Left to WB	100	50	**125**	70	**200**	50	**125**	70	**200**	80	**200**
	NB Right to EB	150	20	**230**	40	**360**	20	**235**	40	**370**	70	**370**
	EB Through	>500	110	60	110	250	130	145	110	390	160	240
	EB Right to SB	150	0	0	20	0	5	0	20	5	5	5
2. Ruffin Court Project Dwy#3	SB left / right	>50	5	15	10	50	5	25	15	60	15	90
	WB Through	>100	0	0	0	0	0	0	0	0	0	0
	WB right to NB	>100	0	0	0	0	0	0	0	0	0	0
	EB Left to NB	>100	5	5	10	10	5	5	10	10	10	10
	EB Through	>100	0	0	0	0	0	0	0	0	0	0
3. Ruffin Court Project Dwy#4	SB left / right	240	0	5	5	10	0	5	5	10	5	20
	WB Through	>100	0	0	0	0	0	0	0	0	0	0
	WB right to NB	>100	0	0	0	0	0	0	0	0	0	0
	EB Left to NB	>100	0	0	5	0	0	0	0	0	0	0
	EB Through	>100	0	0	0	0	0	0	0	0	0	0

Footnote:
Bold indicates calculated queue exceeds available storage length.

12.0 TRANSIT AND OTHER MODES

As described in Section 3, Existing Conditions, 7 bus routes currently serve the project site. Five of these 7 transit routes, (MTS Routes 20, 25, 870, 928 & 960) ply on either Ruffin Road or Clairemont Mesa Boulevard. Future planned transit improvements are described in the following paragraphs.

12.1.1 *I-15 Bus Rapid Transit*

The 20-mile I-15 Express Lanes Project, which extends from SR 78 in Escondido to SR 163, was completed in early 2012. In addition to the existing transit center in Escondido, infrastructure improvements include three transit stations with Park and Ride facilities at Del Lago, Rancho Bernardo, and Sabre Springs. These four stations are connected to the Express Lanes via Direct Access Ramps (DARs) which allow buses, carpoolers, vanpoolers, and FasTrak users, access to the Express Lanes without encountering the congestion at the general traffic freeway on-ramps. In 2013, construction will conclude on the Mira Mesa/Scripps Ranch Transit Station located at Hillery Drive. Construction on its attached DAR will conclude in 2014. In early 2014, new Bus Rapid Transit (BRT), a bus service that is the first of its kind in San Diego, will begin to operate along the Express Lanes using the facilities noted above. Information regarding funding of this project is not known at this time. The new services will include:

1. An all-day, all-stops, bi-directional freeway service between the Escondido Transit Center and downtown San Diego,

2. An all-day, limited stop, bi-directional service between Escondido Transit Center and Sorrento Mesa (via Mira Mesa Blvd), UTC, and UCSD (via I-805 and La Jolla Village Drive), and,

3. Two peak period, peak-direction-only Commuter Express services using the existing 800 Series routes buses. The San Diego bound services will allow patrons to connect to the Mid-City Rapid and South Bay BRT services as well.

The benefits of the BRT service include more frequent and longer hours of service. During peak morning and afternoon commutes, service will be every 10 to 15 minutes. During off-peak hours, service will be every 15 to 30 minutes. In addition to providing faster service and increased routes, future BRT service will also offer 27 new buses with improvements designed to make the ride more comfortable, accessible and convenient for passengers. BRT buses will be designed to streamline and speed up the boarding process by featuring multiple doors, low-floor designs and fare-boxes that accept Compass Cards. Additional design features, such as comfortable seating and larger windows, will improve ride quality and video monitors will provide announcements on station stops and other transit information.

12.1.2 *Bus Stop Relocation*

Kaiser will work with MTS to relocate the existing bus stop for Routes #25 and #928 on Clairemont Mesa Boulevard just west of Ruffin Road, to a location to the east of Ruffin Road, along the project frontage. MTS generally prefers far-side bus stops and providing a bus stop along the project frontage will be a convenience to patients and visitors since they will not need to cross a four-lane major Road (Ruffin Road) to access the hospital.

13.0 TRANSPORTATION DEMAND MANAGEMENT

In an effort to reduce vehicular trips to and from the proposed project, a Transportation Demand Management Plan (TDM) was developed that would encourage staff and visitors to use alternate forms of transportation other than single occupancy vehicles and to shift vehicle trips out of the peak hour. The following TDM plan will be provided by Kaiser.

1. Kaiser Permanente will coordinate with MTS and NCTD to offer partially subsidized monthly passes for employees.
2. Provide preferentially located carpool/vanpool parking spaces in the employee parking area for use by qualified employees in an area closest to the entrance to the building. Sign and stripe these spaces "Car/Vanpool Parking Only". Information about the availability of and the means of accessing the car/vanpool parking spaces should be posted on Transportation Information Displays and communication regarding parking privileges.
3. Display transportation information in common areas accessible to employees and patients in each building. Transportation Information Displays should include, at a minimum, the following materials:
    - Maps, routes, and schedules for public transit serving the site
    - Ridesharing promotional material
    - Bicycle route and parking including maps and bicycle safety information
    - Materials publicizing internet and telephone numbers for referrals on transportation information
    - Promotional materials supplied by NCTD, MTS, and/or other publicly supported transportation organizations
    - A listing of facilities at the site for carpoolers/vanpoolers, transit riders, bicyclist and pedestrians, including information on the availability of preferential carpool/vanpool parking spaces and the methods for obtaining these spaces
4. Offer office employees the opportunity to register for commuter ridematching provided through publicly sponsored services (e.g., SANDAG sponsored "iCommute Ridetracker")
5. Stage two events annually to promote use of alternative transportation.
6. Provide bicycle racks, lockers and showers inside for employee use.
7. Ensure that employees that share rides to work are provided with a ride to their home or location near their residence in the event that an emergency occurs during the work day that requires transportation. SANDAG's iCommute Guaranteed Ride Home service will be engaged to provide this service.
8. Provide flexible work schedules to stagger arrivals and departures. Operating practices of the Medical Center that have employees working schedules that start and stop throughout the day will reduce peak trip generation. The work schedules are yet to be determined however, based on the existing Kaiser Permanente Zion Medical Center, approximately 54% of all staff have rotating shift (i.e. day, evening, or night shift). Kaiser will examine all opportunities to rotate shift outside peak travel times as part of the TDM Plan.

9. Conduct an employee commute travel survey within six months of occupancy of the Kaiser San Diego Central Medical Center and annually thereafter
10. Submit a TDM Status Report annually to the City of San Diego that includes:
    - Name, phone number, and email address for the site's TDM contact
    - Number of employees at the work site during normal business hours
    - Average Vehicle Ridership and mode share
    - Demonstration of 'good faith effort' to implement the TDM actions identified in this document
11. With a view to achieving the goals of the TDM Ordinance, Kaiser will participate in the Kearny Mesa Traffic Management Association (TMA).

14.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

14.1 Significance of Impacts

14.1.1 *Direct Impacts*

EXISTING + PROJECT PHASE I (PROJECT PHASE 1 IMPACTS)

Based on the City of San Diego significance criteria, no direct significant impacts were determined in the Existing + Project Phase 1 scenario.

Intersections

None

Segments

None

Freeway Segments

None

Ramp Meters

None

EXISTING + ENTIRE PROJECT (PROJECT PHASE 2 IMPACTS)

Based on the City of San Diego significance criteria, no direct significant impacts were determined in the Existing + Entire Project (Phase 2) scenario.

Intersections

None

Segments

None

Freeway Segments

None

Ramp Meters

None

NEAR-TERM + PROJECT PHASE I (PROJECT PHASE 1 IMPACTS)

Based on the City of San Diego significance criteria, no direct significant impacts were determined in the Near-Term + Project Phase 1 scenario.

Intersections

None

Segments

None

Freeway Segments

None

Ramp Meters

None

NEAR-TERM + ENTIRE PROJECT (PROJECT PHASE 2 IMPACTS)

Based on the City of San Diego significance criteria, the following direct significant impacts were determined in the Near-Term + Entire Project scenario.

Intersections

D-1. Clairemont Mesa Boulevard / Ruffin Road
D-2. Balboa Avenue / Ruffin Road

Segments

None

Freeway Segments

None

Ramp Meters

None

14.1.2 *Cumulative Impacts*

YEAR 2035 + ENTIRE PROJECT

Based on the City of San Diego significance criteria, the following long-term cumulative impacts were determined in the Year 2035 with Entire Project scenario.

Intersections

C-1. Clairemont Mesa Boulevard / Ruffin Road
C-2. Clairemont Mesa Boulevard / Murphy Canyon Road
C-3. Balboa Avenue / Ruffin Road
C-4. Balboa Avenue / View Ridge Avenue

Segments

None

Freeway Segments

C-5. I-15: Clairemont Mesa Boulevard to Balboa Avenue
C-6. I-15: Balboa Avenue to Aero Drive

Ramp Meter

C-7. Clairemont Mesa Boulevard to SB I-15

14.2 Recommended Mitigation Measures

The following recommended mitigation measures are depicted in ***Figure 14-1***:

14.2.1 *Direct Impacts*

EXISTING + PROJECT PHASE 1

Since the project did not have any direct impacts in this analysis scenario, no mitigation measures are required. Therefore, no mitigation measures are required prior to the development and operation of the Project Phase I.

EXISTING + ENTIRE PROJECT

Since the project did not have any direct impacts in this analysis scenario, no mitigation measures are required. Therefore, no mitigation measures are required prior to the development and operation of the Entire Project.

NEAR-TERM + PROJECT PHASE 1

Since the project did not have any direct impacts in this analysis scenario, no mitigation measures are required. Therefore, no mitigation measures are required prior to the development and operation of the Project Phase I.

NEAR-TERM + ENTIRE PROJECT

The following mitigation measures are recommended for the impacted locations for the Near-Term + Entire Project scenario. These mitigation measures will be implemented prior to the development and operation of the Project Phase 2 (entire Project).

Intersections

D-1. Clairemont Mesa Boulevard / Ruffin Road (100% contribution)

The improvement required to mitigate this impact is an eastbound right-turn lane on Clairemont Mesa Boulevard. ***Figure M-1*** in ***Appendix M*** graphically depicts the potential improvement. The median would be relocated 3 feet to the north and the eastbound lanes would be reconfigured to provide a bike lane and an eastbound right-turn lane. This would require the acquisition of approximately 10 feet x 190 feet of additional

right-of-way (ROW) from the existing retail center at the southwest corner of the intersection. Acquisition of 10 foot of ROW would result in reducing the existing building 28-foot setback from the curb line to 18 feet, and may be difficult to achieve in a timely manner.

Based on the above discussion, this impact is considered significant and potentially unmitigated.

D-2. Balboa Avenue / Ruffin Road (100% contribution)

Modify signal and provide SB to WB right-turn overlap phasing at the Balboa Avenue / Ruffin Road intersection. (U-turns are not currently permitted and therefore, providing SB right-turn overlap phasing will not impact any U-turning traffic).

14.2.2 *Cumulative Impacts*

YEAR 2035 + ENTIRE PROJECT

The following mitigation measures are recommended for the impacted locations:

Intersections

C-1. Clairemont Mesa Boulevard / Ruffin Road (100% contribution)

See description for direct impact D-1.

C-2. Clairemont Mesa Boulevard / Murphy Canyon Road (100% contribution)

The third EB through lane on Clairemont Mesa Boulevard between Ruffin Road and Murphy Canyon Road that the project will provide prior to opening day will become a shared through / right-turn lane at Murphy Canyon Road, therefore providing additional capacity at the intersection (see conceptual drawing ***M-2*** in *Appendix M* for a conceptual plan).

C-3. Balboa Avenue / Ruffin Road (100% contribution)

The mitigation measure recommended for the direct impact (D-2) will also mitigate this cumulative impact.

C-4. Balboa Avenue / Viewridge Avenue (100% contribution)

Restripe the southbound approach of the Balboa Avenue / Viewridge Avenue intersection to provide a second southbound left-turn lane (see conceptual drawing ***M-3*** in *Appendix M* for a conceptual plan). Also, provide suitable signal modifications to accommodate the second southbound left-turn lane.

The above improvements will result in the elimination of parking for a distance of 160 feet along the east curb of View Ridge Avenue, north of Balboa Avenue. This is a reduction of approximately 7 parking spaces. Field observations during various times indicated a maximum of 4 and minimum of 1 occupied spaces. Several empty spaces

were observed close to these spaces. The land uses fronting View Ridge Avenue provide adequate parking spaces onsite. Therefore, the demand for parking is unlikely to increase in the future. Hence, eliminating these spaces is not expected to result in any hardship to current users.

Freeway Segments

C-5. I-15: Clairemont Mesa Boulevard to Balboa Avenue

The project should contribute a fair share of 8% towards future improvements on I-15. Since there is no programmed improvement plan for this segment of I-15, the impact is considered not fully mitigated.

C-6. I-15: Balboa Avenue to Aero Drive

The project should contribute a fair share 10% towards future improvements on I-15. Since there is no programmed improvement plan for this segment of I-15, the impact is considered not fully mitigated.

Ramp Meters

C-7. Clairemont Mesa Blvd to SB I-15 Metered Freeway On-Ramp

The Clairemont Mesa Boulevard to SB I-15 on-Ramp currently has one HOV lane and 2 SOV lanes and is built to its ultimate configuration, therefore, no feasible mitigation is available and the impact is considered not mitigated.

14.3 Project Frontage and On-Site Circulation Improvements

In addition to the above mitigation improvements, the project will provide the following frontage improvements as part of the Project Phase 1:

F-1. Clairemont Mesa Boulevard: Ruffin Road to Murphy Canyon Road

The project will dedicate appropriate right-of-way along its entire frontage on Clairemont Mesa Boulevard including appropriate off-site transitions and construct a third EB through lane between Ruffin Road and Murphy Canyon Road (see conceptual drawing *M*-2 in *Appendix M*).

F-2. Clairemont Mesa Boulevard / Project Driveway

The Project will install a traffic signal at this new intersection and provide interconnect to the existing coordinated signal system on Clairemont Mesa Boulevard. The Project will provide the following lane configuration (see conceptual drawing *M-2* in *Appendix M*).

- **WB:** Two 300-foot long left-turn lanes and three through lanes
- **NB:** Two right-turn lanes and one left-turn lane
- **EB:** One 150-foot long right-turn lane, three through lanes and a Class II bike lane

F-3. Ruffin Road: North of Ruffin Court

Provide a 280 foot long raised median on Ruffin Road, just north of Ruffin Court. (see conceptual drawing ***M-4*** in *Appendix M*).

F-4. On-Site Circulation

SB traffic will not be stopped at the first internal intersection of the roadway from the Clairemont Mesa Boulevard signalized access point.

F-5. Bus Stop

The project will relocate the existing bus stop for EB routes #25 and #928 on Clairemont Mesa Boulevard (currently located just west of Ruffin Road on the south side of Clairemont Mesa Boulevard) to the east side on Ruffin Road, along the project frontage.

14.4 Post Mitigation Analysis

A mitigation analysis was conducted to demonstrate that the recommended mitigation measures would mitigate project impacts to below a level of significance. Conceptual sketches for the various recommended improvements are included in *Appendix M*.

Table 14-1 summarizes the results of the post mitigation intersection analysis. As seen in *Table 14-1*, in the Near-Term, the two intersections that are directly impacted are calculated to operate at LOS E with the recommended mitigation, but with less delay than for the without project traffic condition. Hence the impact is considered mitigated.

TABLE 14-1
POST-MITIGATION ANALYSIS

Intersection	Peak Period	Pre Mitigation Conditions				Post Mitigation With Project Traffic [a]	
		Without Project Traffic		With Project Traffic			
		Delay	LOS	Delay	LOS	Delay	LOS
Near-Term							
7. Clairemont Mesa Blvd / Ruffin Rd [b]	PM	56.6	E	59.6	E	-	-
22. Ruffin Rd / Balboa Ave	PM	68.1	E	73.7	E	64.4	E
Long-Term							
7. Clairemont Mesa Blvd / Ruffin Rd	PM	61.6	E	65.1	E	61.5	E
8. Clairemont Mesa Blvd / Murphy Canyon Rd	PM	46.8	D	58.4	E	25.1	C
22. Ruffin Rd / Balboa Ave	PM	60.8	E	66.4	E	58.0	E
23. Viewridge Ave / Balboa Ave	PM	52.8	D	57.9	E	40.6	D

Footnotes:

a. The post-mitigation delay is below the Pre-mitigation without project traffic delay.

b. This impact is significant and unmitigated as described in Section 14-2 above. Hence, the delay and LOS with mitigation are not shown.

In the Long-Term, with the addition of project traffic and with the implementation of the recommended mitigation, two of the four impacted intersections are calculated to operate at an acceptable LOS of D or better. The remaining three intersections, Clairemont Mesa Boulevard / Ruffin Road and Ruffin Road / Balboa Avenue are calculated to continue operate at LOS E with the implementation of the recommended mitigation measures, but with less delay than for the without project traffic condition. Hence, the impact is considered mitigated.

The mitigation analysis worksheets for the impacted intersections are included in ***Appendix N***.

14.5 Fair Share Calculations

Fair share calculations were conducted to determine the Project's percentage responsibility for each cumulatively impacted location where a direct impact is not also calculated (100% contribution for direct impacts). Thus, fair share calculations were conducted for the following 4 locations:

- Viewridge Avenue / Balboa Avenue intersection (fully mitigated)
- I-15 freeway segment from Clairemont Mesa Boulevard to Balboa Avenue (partially mitigated)
- I-15 freeway segment from Balboa Avenue to Aero Drive (partially mitigated)
- Metered Ramp from Clairemont Mesa Boulevard to SB I-15 (not mitigated)

Table 14-2 summarizes the fair share calculations for all impacted intersections, Freeway Mainline Segments and Ramp Meters.

TABLE 14-2
FAIR SHARE CALCULATIONS

Description	Entering PM Peak Hour Volume				Project Contribution Percentage
	Existing	Year 2035 With Project	Increase	Project	
Intersections					
23. Viewridge Ave / Balboa Ave	3,651	4,897	1,246	97	8%
Freeway Segments					
I-15: Clairemont Mesa Blvd to Balboa Ave	21,672	27,293	5,622	454	8%
I-15: Balboa Avenue to Aero Drive	23,338	29,171	5,833	575	10%
Ramp Meter					
Clairemont Mesa Blvd to SB I-15	771	1,370	599	230	38%

14.6 Conclusion

With implementation of the above recommended mitigation measures, the significant direct and cumulative impacts are considered fully mitigated, except for the significant cumulative impacts on two I-15 Freeway segments and the metered On-Ramp at Clairemont Mesa Boulevard / I-15 SB On-Ramp. In addition, the project will provide the following frontage improvements with Project Phase 1.

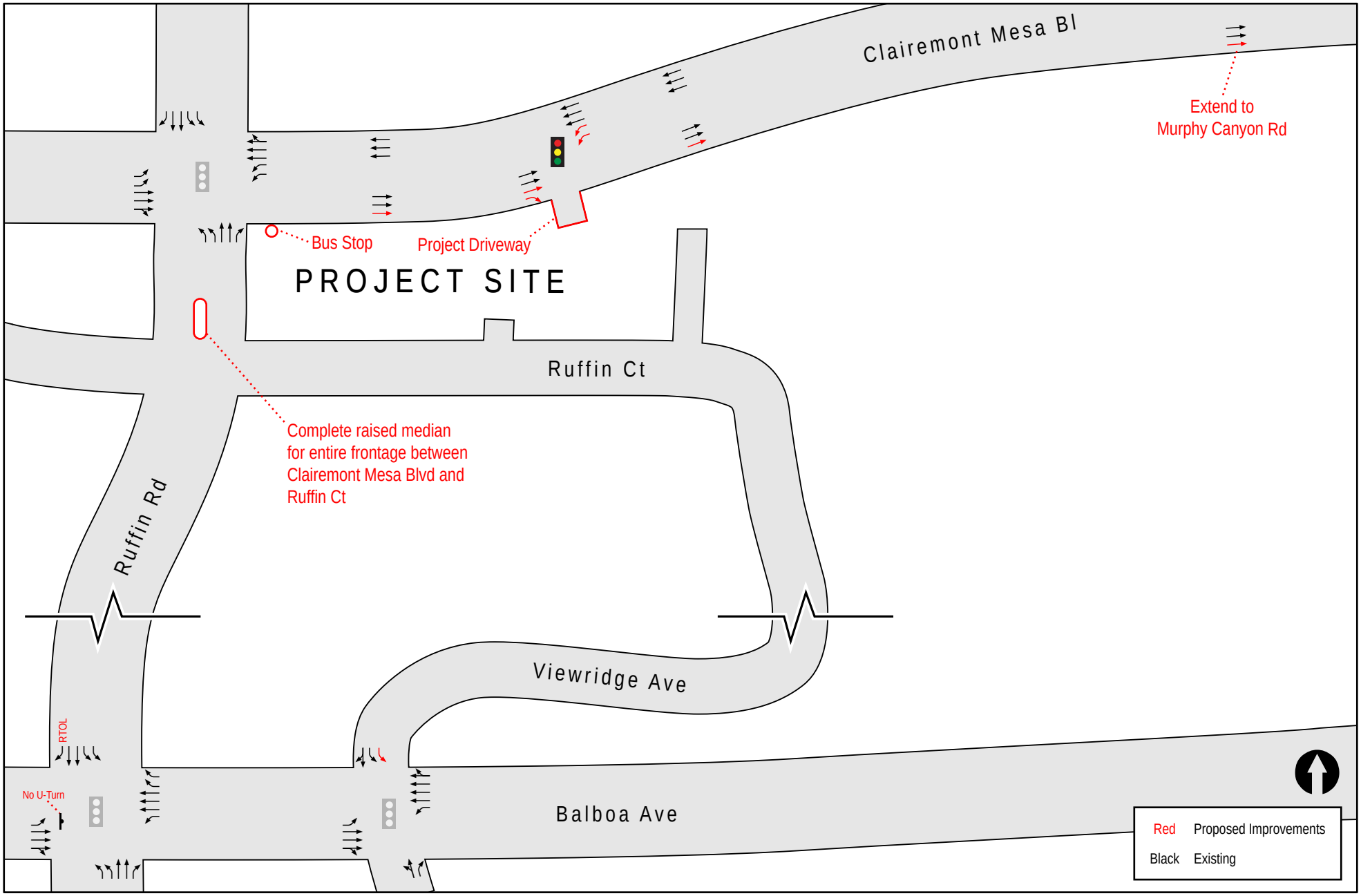
- *Clairemont Mesa Boulevard* - The Project will dedicate appropriate right-of way necessary for improving Clairemont Mesa Boulevard along its frontage, including appropriate transitions and install a traffic signal at the Clairemont Mesa Boulevard / Project Driveway #1 intersection and provide the following geometry (see conceptual plan in *Appendix M*):
  - **WB:** Two 300-foot long left-turn lanes and three through lanes
  - **NB:** Two right-turn lanes and one left-turn lane
  - **EB:** One 150-foot long right-turn lane, three through lanes and a Class II bike lane.

  Peak hour signal warrant analysis indicates a traffic signal is warranted in the near and long-terms, during the PM peak hour (***Appendix O***).

- *Ruffin Road* - Provide a 280 foot long raised median in the southern portion of Ruffin Road, between Clairemont Mesa Boulevard and Ruffin Court where a median does not currently exist (see Figure M-4 in *Appendix M*).

- *On-Site Circulation* - In terms of on-site circulation, southbound traffic will not be stopped at the first internal intersection of the roadway from the Clairemont Mesa Boulevard driveway.

- *Bus Stop* - The existing bus stop for Routes #25 and #928 on Clairemont Mesa Boulevard currently located just west of Ruffin Road on the south side of Clairemont Mesa Boulevard should be relocated to the east side of Ruffin Road, along the project frontage.



LINSCOTT LAW & GREENSPAN engineers

Figure 14-1

Proposed Improvements

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

LINSCOTT
LAW &
GREENSPAN
engineers

TECHNICAL APPENDICES

KAISER SAN DIEGO CENTRAL MEDICAL CENTER

San Diego, California
May 17th, 2013

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APPENDIX A

THE METROPOLITAN TRANSIT SYSTEM ROUTE MAPS AND SCHEDULES

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*

Day Pass (Regional) / *Pase diario (Regional)*	**$5.00**
One-Way Fare / *Tarifa de una direccíon*	**$2.25**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$1.10***
Children 5 & under / *Niños de 5 años o menos* Up to two children ride free per paying adult / *Máximo dos niños viajan gratis por cada adulto*	**FREE** / ***GRATIS***

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	**$72.00**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$18.00***
Youths (18 and under) *Jóvenes (18 años o menos)*	**$36.00***

*I.D. required for discount fare or pass.
**Se requiere identificación para tarifas o pases de descuento.*

DAY PASS (REGIONAL) / ***Pase diario (Regional)***

Valid for unlimited travel for one person on Trolley, most MTS buses, NCTD BREEZE and SPRINTER. Valid for a discount on COASTER fares. Not valid on Premium Express, Rural, Access, or special service buses.

Válidos para viajes ilimitados de una sola persona para: el Trolley, la mayoría de los autobuses de MTS, y los servicios del NCTD de BREEZE y SPRINTER. Válidos para acceder a descuentos en el COASTER, pero no para las rutas Premium Express, rurales, Access, ni los servicios especiales.

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	**511** or/ó **(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005** or/ó **(888) 722-4889**
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas* (via teléfono de teclas)	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
SafeWatch	**(619) 557-4500**
The Transit Store / Lost & Found *The Transit Store / Objetos extraviados*	**(619) 234-1060**
Articles found on the bus are turned in at The Transit Store *Artículos encontrados en los autobuses son entregados a The Transit Store*	1st & Broadway Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**www.sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at The Transit Store, or visit **www.sdmts.com**.

*Para obtener más información sobre el uso de los servicios de MTS, recoga un 'Rider's Guide' en un autobús o en The Transit Store, o visita a **www.sdmts.com**.*

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JUNE 10, 2012

20 — Downtown – Del Lago Station
via Fashion Valley

210 — Downtown – Mira Mesa Express
via I-15 / Mid-City

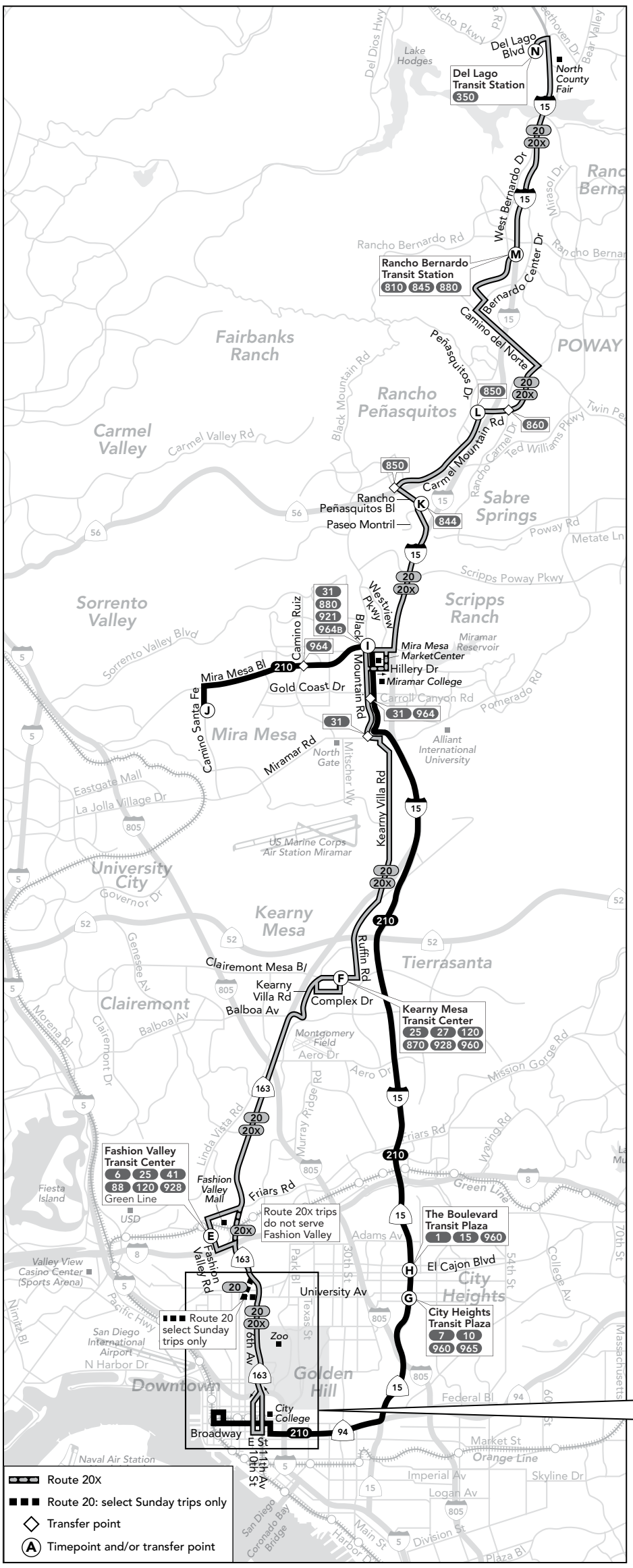
DESTINATIONS

- City College
- Downtown Courthouses (210)
- Fashion Valley Mall (20)
- Miramar College
- Mira Mesa MarketCenter

TROLLEY CONNECTIONS
America Plaza (210)
City College
Fashion Valley (20)

MTS Metropolitan Transit System

Alternative formats available upon request. Please call: (619) 557-4555 / *Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555*



Route 210 – Monday through Friday / *lunes a viernes*

Morning only

Mira Mesa ➡ City Heights ➡ Downtown

J Camino Santa Fe & Flanders Dr. **DEPART**	I Black Mountain Rd. & Mira Mesa Blvd.	H The Boulevard Transit Plaza (El Cajon Blvd.)	G City Heights Transit Plaza (University Ave.)	D City College Trolley (Broadway)	B Broadway & 4th Ave.	A India St. & C St. **ARRIVE**
6:01a	6:12a	6:30a	6:32a	6:42a	6:46a	6:54a
6:16	6:27	6:45	6:47	6:57	7:01	7:09
6:31	6:43	7:03	7:05	7:16	7:20	7:29
6:46	6:58	7:18	7:20	7:31	7:35	7:44
7:06	7:18	7:40	7:42	7:54	7:59	8:08

Route 210 – Monday through Friday / *lunes a viernes*

Afternoon only

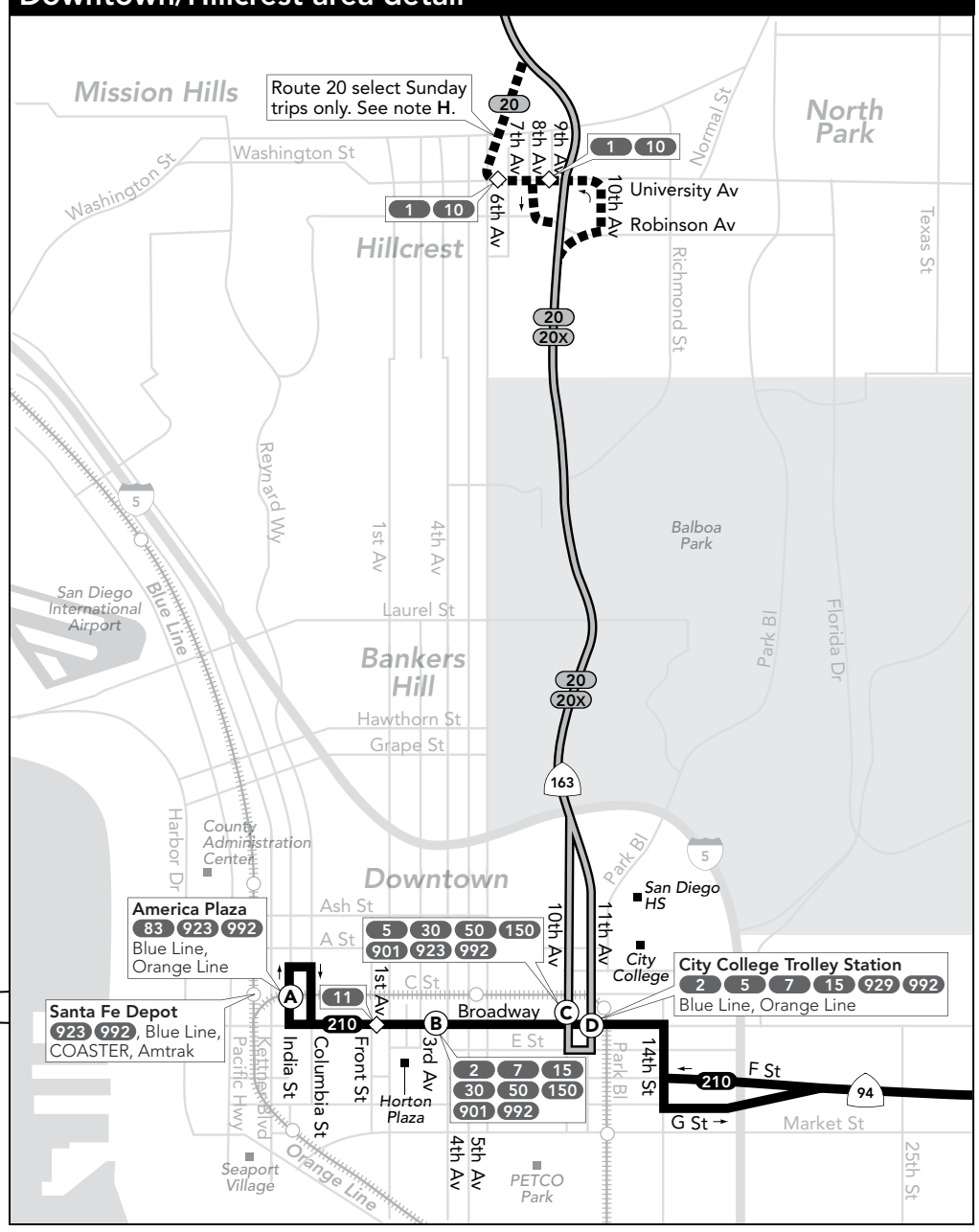
Downtown ➡ City Heights ➡ Mira Mesa

A India St. & C St. **DEPART**	B Broadway & 3rd Ave.	D City College Trolley (Broadway)	G City Heights Transit Plaza (University Ave.)	H The Boulevard Transit Plaza (El Cajon Blvd.)	I Black Mountain Rd. & Mira Mesa Blvd.	J Camino Santa Fe & Flanders Dr. **ARRIVE**
4:03p	**4:10p**	**4:16p**	**4:25p**	**4:27p**	**4:49p**	**5:04p**
4:23	**4:30**	**4:36**	**4:45**	**4:47**	**5:09**	**5:24**
4:43	**4:50**	**4:56**	**5:06**	**5:08**	**5:32**	**5:47**
5:08	**5:15**	**5:21**	**5:31**	**5:33**	**5:57**	**6:12**
5:38	**5:45**	**5:51**	**6:00**	**6:02**	**6:25**	**6:39**

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.

Los horarios e información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

Downtown/Hillcrest area detail



A Saturday or Sunday schedule will be operated on the following holidays and observed holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

Se operará con horario de sábado o domingo durante los siguientes días festivos y feriados observados:

Route 20 – Monday through Friday / *lunes a viernes*

Downtown ➡ Kearny Mesa ➡ Rancho Bernardo ➡ Escondido

Ⓒ 10th Ave. & Broadway DEPART	Ⓓ City College Trolley Station (11th Ave.)	Ⓔ Fashion Valley Transit Center ARRIVE	Ⓔ Fashion Valley Transit Center DEPART	Ⓕ Kearny Mesa Transit Center	Ⓘ Mira Mesa Bl. & Black Mountain Rd.	Ⓚ Rancho Peñasquitos & Paseo Montril	Ⓛ Carmel Mtn. & Peñasquitos Dr.	Ⓜ Rancho Bernardo Transit Station	Ⓝ Del Lago Transit Station ARRIVE
—	**D** 4:52a	DIRECT EXPRESS							5:27a
—	4:53	5:04a	5:04a	5:16a	5:32a	5:38a	5:46a	6:00a	6:07
—	5:23	5:34	5:34	5:46	6:02	6:08	6:16	6:30	6:37
—	5:33	5:44	5:46	6:00	—	—	—	—	—
—	**X** 5:53	EXPRESS		6:07	6:27	6:35	6:43	6:58	7:05
—	6:02	6:13	6:15	6:29	—	—	—	—	—
X 6:16a	6:19	EXPRESS		6:33	6:56	7:04	7:13	7:28	7:35
6:29	6:32	6:43	6:45	6:59	—	—	—	—	—
X 6:46	6:49	EXPRESS		7:03	7:26	7:34	7:43	7:58	8:05
6:59	7:02	7:13	7:15	7:29	—	—	—	—	—
X 7:16	7:19	EXPRESS		7:34	7:57	8:05	8:14	8:29	8:36
7:29	7:32	7:43	7:45	7:59	—	—	—	—	—
X 7:46	7:49	EXPRESS		8:04	8:27	8:35	8:44	8:59	9:06
7:59	8:02	8:13	8:15	8:29	—	—	—	—	—
X 8:16	8:19	EXPRESS		8:34	8:56	9:04	9:13	9:29	9:36
8:29	8:32	8:43	8:45	8:59	—	—	—	—	—
X 8:46	8:49	EXPRESS		9:04	9:26 **V**	—	—	—	—
9:06	9:09	9:20	9:22	9:36	9:58	10:06	10:15	10:31	10:38
9:36	9:39	9:50	9:52	10:06	10:28 **V**	—	—	—	—
10:06	10:09	10:20	10:22	10:36	10:58	11:06	11:15	11:31	11:38
10:36	10:39	10:50	10:52	11:06	11:28 **V**	—	—	—	—
11:06	11:09	11:20	11:22	11:36	11:58	**12:06p**	**12:15p**	**12:32p**	**12:39p**
11:36	11:39	11:50	11:52	**12:06p**	**12:28p V**	—	—	—	—
12:06p	**12:09p**	**12:20p**	**12:22p**	**12:36**	**12:58**	**1:06**	**1:15**	**1:32**	**1:39**
12:36	**12:39**	**12:50**	**12:52**	**1:06**	**1:28 V**	—	—	—	—
1:05	**1:08**	**1:20**	**1:22**	**1:37**	**1:59**	**2:07**	**2:16**	**2:33**	**2:40**
1:35	**1:38**	**1:50**	**1:52**	**2:07**	**2:29 V**	—	—	—	—
2:04	**2:07**	**2:20**	**2:22**	**2:38**	**3:02**	**3:11**	**3:22**	**3:39**	**3:46**
2:34	**2:37**	**2:50**	**2:52**	**3:08**	**3:32**	**3:41**	**3:52**	**4:09**	**4:16**
3:01	**3:04**	**3:17**	**3:19**	**3:35**	—	—	—	—	—
X 3:19	**3:22**	EXPRESS		**3:39**	**4:03**	**4:12**	**4:23**	**4:40**	**4:47**
3:31	**3:34**	**3:47**	**3:49**	**4:05**	—	—	—	—	—
X 3:49	**3:52**	EXPRESS		**4:09**	**4:33**	**4:42**	**4:53**	**5:10**	**5:17**
4:01	**4:04**	**4:17**	**4:19**	**4:35**	—	—	—	—	—
X 4:19	**4:22**	EXPRESS		**4:39**	**5:04**	**5:13**	**5:24**	**5:41**	**5:48**
4:31	**4:34**	**4:47**	**4:49**	**5:05**	—	—	—	—	—
X 4:49	**4:52**	EXPRESS		**5:09**	**5:34**	**5:43**	**5:54**	**6:11**	**6:18**
5:06	**5:09**	**5:21**	**5:23**	**5:39**	—	—	—	—	—
X 5:23	**5:26**	EXPRESS		**5:43**	**6:08**	**6:17**	**6:28**	**6:45**	**6:52**
5:36	**5:39**	**5:51**	**5:53**	**6:09**	—	—	—	—	—
X 5:54	**5:57**	EXPRESS		**6:13**	**6:36**	**6:44**	**6:54**	**7:10**	**7:17**
6:09	**6:12**	**6:23**	**6:25**	**6:39**	—	—	—	—	—
6:24	**6:27**	**6:38**	**6:40**	**6:54**	**7:14**	**7:22**	**7:31**	**7:45**	**7:51**
6:54	**6:57**	**7:08**	**7:10**	**7:24**	**7:44**	**7:52**	**8:01**	**8:15**	**8:21**
7:20	**7:23**	**7:34**	**7:37**	**7:50**	**8:08**	**8:15**	**8:23**	**8:36**	**8:42**
7:50	**7:53**	**8:04**	**8:07**	**8:20**	**8:38**	**8:45**	**8:53**	**9:06**	**9:12**
8:50	**8:53**	**9:04**	**9:07**	**9:20**	**9:38**	**9:45**	**9:53**	**10:06**	**10:12**

Escondido ➡ Rancho Bernardo ➡ Kearny Mesa ➡ Downtown

Ⓝ Del Lago Transit Station DEPART	Ⓜ Rancho Bernardo Transit Station	Ⓛ Carmel Mtn. & Peñasquitos Dr.	Ⓚ Rancho Peñasquitos & Paseo Montril	Ⓘ Mira Mesa Bl. & Black Mountain Rd.	Ⓕ Kearny Mesa Transit Center	Ⓔ Fashion Valley Transit Center ARRIVE	Ⓔ Fashion Valley Transit Center DEPART	Ⓒ 10th Ave. & Broadway ARRIVE
4:41a	4:48a	5:03a	5:11a	5:19a	5:39a	5:51a	5:53a	6:02a
X 5:04	5:11	5:26	5:34	5:42	6:02	EXPRESS		6:15
—	—	—	—	—	6:08	6:21	6:23	6:33
X 5:30	5:37	5:53	6:02	6:10	6:32	EXPRESS		6:45
—	—	—	—	—	6:37	6:50	6:52	7:02
X 5:50	5:58	6:16	6:28	6:39	7:02	EXPRESS		7:17
—	—	—	—	—	7:07	7:20	7:22	7:32
X 6:20	6:28	6:46	6:58	7:09	7:32	EXPRESS		7:47
—	—	—	—	—	7:37	7:50	7:52	8:02
X 6:50	6:58	7:16	7:28	7:39	8:02	EXPRESS		8:17
—	—	—	—	—	8:07	8:20	8:22	8:32
7:20	7:28	7:46	7:58	8:09	8:32	8:45	8:50	9:00
7:49	7:57	8:15	8:27	8:38	9:01	9:14	9:16	9:26
8:19	8:27	8:45	8:56	9:07	9:29	9:42	9:44	9:54
8:49	8:57	9:15	9:26	9:37	9:59	10:12	10:14	10:24
—	—	—	—	**W** 10:06	10:28	10:41	10:43	10:52
9:52	9:59	10:16	10:25	10:33	10:55	11:08	11:10	11:19
—	—	—	—	**W** 11:03	11:25	11:38	11:40	11:49
10:52	10:59	11:16	11:25	11:33	11:55	**12:08p**	**12:10p**	**12:19p**
—	—	—	—	**W 12:03p**	**12:25p**	**12:39**	**12:41**	**12:50**
11:50	11:57	**12:15p**	**12:25p**	**12:33**	**12:58**	**1:12**	**1:14**	**1:23**
—	—	—	—	**W 1:03**	**1:28**	**1:42**	**1:44**	**1:53**
12:54p	**1:01p**	**1:19**	**1:29**	**1:37**	**2:02**	**2:16**	**2:20**	**2:29**
—	—	—	—	**WX 2:07**	**2:32**	EXPRESS		**2:46**
—	—	—	—	—	**2:37**	**2:51**	**2:53**	**3:02**
X 1:54	**2:01**	**2:19**	**2:29**	**2:37**	**3:02**	EXPRESS		**3:16**
—	—	—	—	—	**3:07**	**3:22**	**3:24**	**3:35**
—	—	—	—	**WX 3:07**	**3:32**	EXPRESS		**3:47**
—	—	—	—	—	**3:41**	**3:56**	**3:58**	**4:09**
—	—	—	—	**WX 3:22**	**3:47**	EXPRESS		**4:02**
X 2:54	**3:01**	**3:19**	**3:29**	**3:37**	**4:02**	EXPRESS		**4:16**
—	—	—	—	—	**4:11**	**4:26**	**4:28**	**4:39**
—	—	—	—	**WX 3:52**	**4:17**	EXPRESS		**4:32**
X 3:23	**3:30**	**3:49**	**3:58**	**4:07**	**4:32**	EXPRESS		**4:47**
—	—	—	—	—	**4:41**	**4:56**	**4:58**	**5:09**
—	—	—	—	**WX 4:25**	**4:50**	EXPRESS		**5:05**
X 3:59	**4:06**	**4:25**	**4:34**	**4:43**	**5:08**	EXPRESS		**5:23**
—	—	—	—	—	**5:13**	**5:28**	**5:30**	**5:41**
—	—	—	—	**WX 4:59**	**5:24**	EXPRESS		**5:39**
X 4:31	**4:38**	**4:57**	**5:06**	**5:15**	**5:40**	EXPRESS		**5:55**
—	—	—	—	—	**5:45**	**6:00**	**6:02**	**6:11**
—	—	—	—	**WX 5:33**	**5:56**	EXPRESS		**6:11**
5:04	**5:11**	**5:30**	**5:39**	**5:48**	**6:13**	**6:28**	**6:30**	**6:41**
5:35	**5:42**	**6:00**	**6:09**	**6:18**	**6:41**	**6:56**	**6:58**	**7:07**
6:12	**6:19**	**6:36**	**6:45**	**6:54**	**7:14**	**7:27**	**7:29**	**7:38**
7:12	**7:19**	**7:36**	**7:45**	**7:54**	**8:14**	**8:27**	**8:29**	**8:38**
D 7:22	DIRECT EXPRESS							**7:57**
8:23	**8:29**	**8:43**	**8:52**	**9:00**	**9:17**	**9:29**	**9:30**	**9:39**
D 8:47	DIRECT EXPRESS							**9:22**
9:24	**9:30**	**9:44**	**9:53**	**10:00**	**10:17**	**10:29**	**10:30**	**10:39**
10:24	**10:30**	**10:44**	**10:53**	**11:00**	**11:17**	**11:29**	**11:30**	**11:39**

Route 20 – Saturday / *sábado*

Downtown ➡ Kearny Mesa ➡ Rancho Bernardo ➡ Escondido

Ⓒ 10th Ave. & Broadway DEPART	Ⓓ City College Trolley Station (11th Ave.)	Ⓔ Fashion Valley Transit Center ARRIVE	Ⓔ Fashion Valley Transit Center DEPART	Ⓕ Kearny Mesa Transit Center	Ⓘ Mira Mesa Bl. & Black Mountain Rd.	Ⓚ Rancho Peñasquitos & Paseo Montril	Ⓛ Carmel Mtn. & Peñasquitos Dr.	Ⓜ Rancho Bernardo Transit Station	Ⓝ Del Lago Transit Station ARRIVE
—	**D** 5:51a	DIRECT EXPRESS							6:22a
—	5:52	6:02a	6:06a	6:18a	6:35a	6:41a	6:49a	7:04a	7:11
—	6:22	6:32	6:36	6:48	7:05	7:11	7:19	7:34	7:41
6:49a	6:52	7:02	7:08	7:21	—	—	—	—	—
7:19	7:22	7:32	7:38	7:51	8:09	8:16	8:24	8:40	8:47
7:49	7:52	8:02	8:08	8:21	—	—	—	—	—
8:19	8:22	8:33	8:38	8:52	9:10	9:17	9:26	9:43	9:50
8:49	8:52	9:03	9:08	9:22	—	—	—	—	—
9:19	9:22	9:33	9:38	9:52	10:10	10:17	10:26	10:43	10:50
9:49	9:52	10:03	—	—	—	—	—	—	—
10:19	10:22	10:33	10:38	10:52	11:10	11:17	11:26	11:43	11:50
10:48	10:51	11:03	—	—	—	—	—	—	—
11:18	11:21	11:33	11:37	11:52	**12:11p**	**12:19p**	**12:28p**	**12:46p**	**12:53p**
11:48	11:51	**12:03p**	—	—	—	—	—	—	—
12:18p	**12:21p**	**12:33**	**12:37p**	**12:52p**	**1:11**	**1:19**	**1:28**	**1:46**	**1:53**
12:48	**12:51**	**1:03**	—	—	—	—	—	—	—
1:18	**1:21**	**1:33**	**1:37**	**1:52**	**2:11**	**2:19**	**2:28**	**2:46**	**2:53**
1:48	**1:51**	**2:03**	—	—	—	—	—	—	—
2:19	**2:22**	**2:34**	**2:38**	**2:53**	**3:12**	**3:20**	**3:29**	**3:47**	**3:54**
2:49	**2:52**	**3:04**	**3:08**	**3:23**	—	—	—	—	—
3:19	**3:22**	**3:34**	**3:38**	**3:53**	**4:12**	**4:20**	**4:29**	**4:47**	**4:54**
3:49	**3:52**	**4:04**	**4:08**	**4:23**	—	—	—	—	—
4:19	**4:22**	**4:34**	**4:38**	**4:53**	**5:12**	**5:20**	**5:29**	**5:47**	**5:54**
4:49	**4:52**	**5:04**	—	—	—	—	—	—	—
5:19	**5:22**	**5:34**	**5:38**	**5:53**	**6:12**	**6:20**	**6:29**	**6:47**	**6:54**
5:49	**5:52**	**6:04**	—	—	—	—	—	—	—
6:19	**6:22**	**6:34**	**6:38**	**6:52**	**7:10**	**7:18**	**7:27**	**7:44**	**7:51**
7:19	**7:22**	**7:34**	**7:38**	**7:52**	**8:10**	**8:17**	**8:25**	**8:42**	**8:49**
8:20	**8:23**	**8:34**	**8:38**	**8:51**	**9:09**	**9:16**	**9:23**	**9:39**	**9:45**

Escondido ➡ Rancho Bernardo ➡ Kearny Mesa ➡ Downtown

Ⓝ Del Lago Transit Station DEPART	Ⓜ Rancho Bernardo Transit Station	Ⓛ Carmel Mtn. & Peñasquitos Dr.	Ⓚ Rancho Peñasquitos & Paseo Montril	Ⓘ Mira Mesa Bl. & Black Mountain Rd.	Ⓕ Kearny Mesa Transit Center	Ⓔ Fashion Valley Transit Center ARRIVE	Ⓔ Fashion Valley Transit Center DEPART	Ⓒ 10th Ave. & Broadway ARRIVE
5:24a	5:31a	5:43a	5:51a	5:57a	6:13a	6:25a	6:28a	6:37a
6:24	6:31	6:43	6:51	6:57	7:13	7:25	7:28	7:37
—	—	—	—	—	7:41	7:54	7:57	8:07
7:20	7:27	7:40	7:48	7:55	8:11	8:24	8:27	8:37
—	—	—	—	—	8:40	8:54	8:57	9:07
8:13	8:20	8:34	8:42	8:50	9:07	9:21	9:24	9:35
—	—	—	—	—	9:36	9:51	9:54	10:05
9:08	9:15	9:30	9:39	9:48	10:06	10:21	10:24	10:35
—	—	—	—	—	—	—	10:54	11:05
10:08	10:15	10:30	10:39	10:48	11:06	11:21	11:24	11:35
—	—	—	—	—	—	—	11:54	**12:05p**
11:08	11:15	11:30	11:39	11:48	**12:06p**	**12:21p**	**12:24p**	**12:35**
—	—	—	—	—		—	**12:54**	**1:05**
12:07p	**12:14p**	**12:29p**	**12:39p**	**12:48p**	**1:06**	**1:21**	**1:24**	**1:35**
—	—	—	—	—	—	—	**1:54**	**2:05**
1:07	**1:14**	**1:29**	**1:39**	**1:48**	**2:06**	**2:21**	**2:24**	**2:35**
—	—	—	—	—	—	—	**2:54**	**3:05**
2:07	**2:14**	**2:29**	**2:39**	**2:48**	**3:06**	**3:21**	**3:24**	**3:35**
—	—	—	—	—	**3:36**	**3:51**	**3:54**	**4:05**
3:07	**3:14**	**3:29**	**3:39**	**3:48**	**4:06**	**4:21**	**4:24**	**4:35**
—	—	—	—	—	**4:36**	**4:51**	**4:54**	**5:05**
4:07	**4:14**	**4:29**	**4:39**	**4:48**	**5:06**	**5:21**	**5:24**	**5:35**
—	—	—	—	—	—	—	**5:54**	**6:04**
5:08	**5:15**	**5:29**	**5:38**	**5:46**	**6:04**	**6:19**	**6:23**	**6:33**
—	—	—	—	—	—	—	**6:53**	**7:03**
6:07	**6:14**	**6:28**	**6:36**	**6:44**	**7:01**	**7:15**	**7:17**	**7:27**
—	—	—	—	—	—	—	**7:53**	**8:03**
7:07	**7:14**	**7:28**	**7:36**	**7:44**	**8:01**	**8:15**	**8:17**	**8:27**
8:09	**8:16**	**8:29**	**8:37**	**8:45**	**9:01**	**9:15**	**9:17**	**9:26**
D 8:51	DIRECT EXPRESS							**9:26**

Route 20 – Sunday / *domingo*

Downtown ➡ Kearny Mesa ➡ Rancho Bernardo ➡ Escondido

Ⓒ 10th Ave. & Broadway DEPART	Ⓓ City College Trolley Station (11th Ave.)	Ⓔ Fashion Valley Transit Center ARRIVE	Ⓔ Fashion Valley Transit Center DEPART	Ⓕ Kearny Mesa Transit Center	Ⓘ Mira Mesa Bl. & Black Mountain Rd.	Ⓚ Rancho Peñasquitos & Paseo Montril	Ⓛ Carmel Mtn. & Peñasquitos Dr.	Ⓜ Rancho Bernardo Transit Station	Ⓝ Del Lago Transit Station ARRIVE
—	6:21a	6:31a	6:41a	6:53a	7:10a	7:16a	7:24a	7:39a	7:46a
—	**D** 6:22	DIRECT EXPRESS							6:53
H 7:46a	7:49 **U**	8:01	8:11	8:24	8:42	8:49	8:57	9:13	9:20
—	**D** 8:20	DIRECT EXPRESS							8:51
H 8:43	8:46 **U**	8:58	9:08	9:22	9:40	9:47	9:56	10:13	10:20
9:44	9:47	9:58	10:08	10:22	10:40	10:47	10:56	11:13	11:20
10:43	10:46	10:58	11:08	11:23	11:42	11:50	11:59	**12:17p**	**12:24p**
11:43	11:46	11:58	**12:08p**	**12:23p**	**12:42p**	**12:50p**	**12:59p**	**1:17**	**1:24**
12:43p	**12:46p**	**12:58p**	**1:08**	**1:23**	**1:42**	**1:50**	**1:59**	**2:17**	**2:24**
1:43	**1:46**	**1:58**	**2:08**	**2:23**	**2:42**	**2:50**	**2:59**	**3:17**	**3:24**
2:43	**2:46**	**2:58**	**3:08**	**3:23**	**3:42**	**3:50**	**3:59**	**4:17**	**4:24**
3:43	**3:46**	**3:58**	**4:08**	**4:23**	**4:42**	**4:50**	**4:59**	**5:17**	**5:24**
4:43	**4:46**	**4:58**	**5:08**	**5:23**	**5:42**	**5:50**	**5:59**	**6:17**	**6:24**
5:43	**5:46**	**5:58**	**6:08**	**6:23**	**6:42**	**6:50**	**6:59**	**7:17**	**7:24**
6:43	**6:46**	**6:58**	**7:08**	**7:22**	**7:40**	**7:48**	**7:57**	**8:14**	**8:21**
7:43	**7:46**	**7:58**	**8:08**	**8:22**	**8:40**	**8:47**	**8:55**	**9:12**	**9:19**

Escondido ➡ Rancho Bernardo ➡ Kearny Mesa ➡ Downtown

Ⓝ Del Lago Transit Station DEPART	Ⓜ Rancho Bernardo Transit Station	Ⓛ Carmel Mtn. & Peñasquitos Dr.	Ⓚ Rancho Peñasquitos & Paseo Montril	Ⓘ Mira Mesa Bl. & Black Mountain Rd.	Ⓕ Kearny Mesa Transit Center	Ⓔ Fashion Valley Transit Center ARRIVE	Ⓔ Fashion Valley Transit Center DEPART	Ⓒ 10th Ave. & Broadway ARRIVE
H 5:59a	6:06a	6:18a	6:26a	6:32a	6:48a	7:00a	7:08a **T**	7:20a
H 6:56	7:03	7:16	7:24	7:31	7:47	8:00	8:08 **T**	8:20
H 7:56	8:03	8:16	8:24	8:31	8:47	9:00	9:08 **T**	9:20
8:52	8:59	9:13	9:21	9:29	9:46	10:00	10:08	10:18
9:45	9:52	10:07	10:16	10:25	10:43	10:58	11:08	11:19
10:45	10:52	11:07	11:16	11:25	11:43	11:58	**12:08p**	**12:19p**
11:45	11:52	**12:07p**	**12:16p**	**12:25p**	**12:43p**	**12:58p**	**1:08**	**1:19**
12:44p	**12:51p**	**1:06**	**1:16**	**1:25**	**1:43**	**1:58**	**2:08**	**2:19**
1:44	**1:51**	**2:06**	**2:16**	**2:25**	**2:43**	**2:58**	**3:08**	**3:19**
2:44	**2:51**	**3:06**	**3:16**	**3:25**	**3:43**	**3:58**	**4:08**	**4:19**
3:44	**3:51**	**4:06**	**4:16**	**4:25**	**4:43**	**4:58**	**5:08**	**5:19**
4:47	**4:54**	**5:08**	**5:17**	**5:25**	**5:43**	**5:58**	**6:08**	**6:19**
H 5:50	**5:57**	**6:11**	**6:19**	**6:27**	**6:44**	**6:58**	**7:08 T**	**7:20**
H 6:50	**6:57**	**7:11**	**7:19**	**7:27**	**7:44**	**7:58**	**8:08 T**	**8:20**
D 7:24	DIRECT EXPRESS							**7:59**
D 8:21	DIRECT EXPRESS							**8:56**

D = Route 20D: Express/no stops between downtown San Diego and Del Lago Transit Station. / *Ruta 20D: Viaje 'Express' sin paradas entre el centro de San Diego y el Del Lago Transit Station.*
H = Route 20 via Fashion Valley and Hillcrest. / *Ruta 20 via Fashion Valley y Hillcrest.*
T = Route 20 arrives/departs University Ave. & 6th Ave. (Hillcrest) 5 minutes after time shown. / *Ruta 20 llegada/salida University Ave. y 6th Ave. (Hillcrest) 5 minutos después de la hora indicada.*
U = Route 20 arrives/departs University Ave. & 7th Ave. (Hillcrest) 6 minutes after time shown. / *Ruta 20 llegada/salida University Ave. y 7th Ave. (Hillcrest) 6 minutos después de la hora indicada.*
V = Trip ends at Westview Parkway at time shown. Trip does not serve the bus stop at Black Mountain Rd. & Mira Mesa Blvd. / *Viaje termina en Westview Parkway en la hora indicada. Viaje no ofrece servicio a la parada de autobús en Black Mountain Rd. y Mira Mesa Blvd.*
W = Begins 3 minutes earlier from Westview Parkway (Mira Mesa Market Center). / *Comienza 3 minutos antes en Westview Parkway (Mira Mesa Market Center).*
X = Route 20X does not serve Fashion Valley. / *Ruta 20X no ofrece servicio a Fashion Valley.*

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*	
Day Pass (Regional) / *Pase diario (Regional)*	$5.00
One-Way Fare / *Tarifa de una direccíon*	$2.25
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.10*
Children 5 & under / *Niños de 5 años o menos*	FREE / *GRATIS**

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menos)*	$36.00*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

Valid for unlimited travel for one person on Trolley, most MTS buses, NCTD Breeze and SPRINTER. Valid for a discount on COASTER fares; not valid on Premium Express, Rural, or special service buses, or ADA paratransit.

Válidos para viajes ilimitados de una sola persona para: el Trolley, la mayoría de los autobuses de MTS, y los servicios del NCTD de BREEZE y SPRINTER. Válidos para acceder a descuentos en el COASTER, pero no para las rutas Premium Express ni rurales, los servicios especiales ni los servicios para discapacitados de ADA.

* I.D. required for discount fare or pass.
** Se requiere identificación para tarifas o pases de descuento.*

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	(619) 656-2300
SafeWatch	(619) 557-4500
Lost & Found *Objetos extraviados*	(619) 427-6438 or/ó (800) 409-3310
The Transit Store	(619) 234-1060 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	www.sdmts.com

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit www.sdmts.com.

Para obtener más información sobre el uso de los servicios de MTS, recoga un 'Rider's Guide' en un autobús o en 'The Transit Store,' o visita a www.sdmts.com.

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JANUARY 30, 2011

25 — Fashion Valley – Kearny Mesa
via Linda Vista / Stonecrest

928 — Fashion Valley – Kearny Mesa
via Serra Mesa / Stonecrest

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION AWARDED OUTSTANDING PUBLIC TRANSIT SYSTEM MTS

DESTINATIONS
- Children's Hospital (25)
- Fashion Valley Mall
- Hazard Center (928)
- Kearny Mesa Courthouse
- Linda Vista Park & Rec Center (25)
- Serra High School (25)
- Sharp Hospital (25)
- Stonecrest Plaza

TROLLEY CONNECTION
Fashion Valley

MTS Metropolitan Transit System

Alternative formats available upon request. Please call: (619) 557-4555 / *Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555*

Route 25

Monday through Friday only / *lunes a viernes solamente*

Fashion Valley ➡ Linda Vista ➡ Tierrasanta ➡ Kearny Mesa

Ⓐ Fashion Valley Transit Center **DEPART**	Ⓑ Comstock St. & Linda Vista Rd.	Ⓒ Sharp Hospital (Health Center & Frost)	Ⓔ Stonecrest Plaza	Ⓕ Tierrasanta Blvd. & Santo Rd.	Ⓖ Clairemont Mesa Blvd. & Santo Rd.	Ⓘ Kearny Mesa Transit Center **ARRIVE**
—	—	—	6:38a	6:44a	6:48a	6:56a
7:09a	7:16a	7:27a	7:38	7:44	7:48	7:56
8:09	8:16	8:27	8:38	8:44	8:48	8:56
9:07	9:14	9:25	9:36	9:42	9:46	9:54
10:07	10:14	10:25	10:36	10:42	10:46	10:54
11:07	11:14	11:25	11:36	11:42	11:46	11:54
12:07p	**12:14p**	**12:25p**	**12:36p**	**12:42p**	**12:46p**	**12:54p**
1:07	**1:14**	**1:26**	**1:39**	**1:46**	**1:50**	**1:58**
2:10	**2:17**	**2:29**	**2:42**	**2:49**	**2:53**	**3:01**
3:10	**3:17**	**3:29**	**3:42**	**3:49**	**3:53**	**4:01**
4:13	**4:20**	**4:32**	**4:45**	**4:52**	**4:56**	**5:04**
5:16	**5:23**	**5:35**	**5:48**	**5:55**	**5:59**	**6:07**
6:18	**6:25**	**6:37**	**6:50**	**6:57**	**7:01**	**7:09**

Kearny Mesa ➡ Tierrasanta ➡ Linda Vista ➡ Fashion Valley

Ⓘ Kearny Mesa Transit Center• **DEPART**	Ⓖ Clairemont Mesa Blvd. & Santo Rd.	Ⓕ Santo Rd. & Tierrasanta Blvd.	Ⓔ Stonecrest Plaza	Ⓒ Sharp Hospital (Health Center & Frost)	Ⓑ Comstock St. & Linda Vista Rd.	Ⓐ Fashion Valley Transit Center **ARRIVE**
—	—	—	6:25a	6:40a	6:51a	6:58a
7:07a	7:13a	7:18a	7:27	7:42	7:53	8:00
8:07	8:13	8:18	8:27	8:42	8:53	9:00
9:07	9:13	9:18	9:27	9:42	9:53	10:00
10:07	10:13	10:18	10:27	10:42	10:53	11:00
11:07	11:13	11:18	11:27	11:42	11:53	**12:00p**
12:07p	**12:13p**	**12:18p**	**12:27p**	**12:42p**	**12:53p**	**1:00**
1:07	**1:13**	**1:18**	**1:27**	**1:43**	**1:55**	**2:03**
2:07	**2:13**	**2:18**	**2:27**	**2:43**	**2:55**	**3:03**
3:10	**3:16**	**3:21**	**3:30**	**3:46**	**3:58**	**4:06**
4:10	**4:16**	**4:21**	**4:30**	**4:46**	**4:58**	**5:06**
5:12	**5:18**	**5:23**	**5:32**	**5:48**	**6:00**	**6:08**
6:17	**6:23**	**6:28**	**6:36**	**6:50**	**7:01**	**7:08**

• = Board bus on Clairemont Mesa Blvd. in front of Spice House Restaurant / *Encuentra el autobús en Clairemont Mesa Blvd. en frente del restaurante Spice House*

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.
Los horarios e información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

Route 928 — Monday through Friday / *lunes a viernes*

Fashion Valley ➡ Kearny Mesa

(A) Fashion Valley T.C. **DEPART**	(D) Murray Ridge & Sandrock	(E) Stone-crest Plaza	(H) Ruffin Rd. & Balboa Ave.	(I) Kearny Mesa T.C. **ARRIVE**
5:24a	5:37a	5:47a	5:53a	6:00a
5:54	6:07	6:17	6:23	6:30
6:24	6:37	6:47	6:53	7:00
6:54	7:07	7:17	7:23	7:30
7:24	7:37	7:47	7:53	8:00
7:54	8:07	8:17	8:23	8:30
8:24	8:37	8:47	8:53	9:00
8:54	9:07	9:17	9:23	9:30
9:24	9:37	9:47	9:53	10:00
9:54	10:07	10:17	10:23	10:30
10:24	10:37	10:47	10:53	11:00
10:54	11:07	11:17	11:23	11:30
11:24	11:37	11:48	11:55	**12:02p**
11:54	**12:08p**	**12:19p**	**12:26p**	**12:34**
12:24p	**12:38**	**12:49**	**12:56**	**1:04**
12:54	**1:08**	**1:19**	**1:26**	**1:34**
1:24	**1:38**	**1:49**	**1:56**	**2:04**
1:54	**2:08**	**2:19**	**2:26**	**2:34**
2:24	**2:38**	**2:49**	**2:56**	**3:04**
2:54	**3:08**	**3:19**	**3:26**	**3:34**
3:24	**3:39**	**3:50**	**3:59**	**4:07**
3:54	**4:09**	**4:20**	**4:29**	**4:37**
4:24	**4:39**	**4:50**	**4:59**	**5:07**
4:54	**5:09**	**5:20**	**5:29**	**5:37**
5:24	**5:39**	**5:50**	**5:59**	**6:07**
5:54	**6:09**	**6:20**	**6:27**	**6:35**
6:28	**6:43**	**6:54**	**7:01**	**7:09**
7:36	**7:50**	**8:00**	**8:06**	**8:13**
8:39	**8:52**	**9:02**	—	—
9:39	**9:52**	**10:02**	—	—

Kearny Mesa ➡ Fashion Valley

(I) Kearny Mesa T.C.• **DEPART**	(H) Ruffin Rd. & Balboa Ave.	(E) Stone-crest Plaza	(D) Murray Ridge & Sandrock	(A) Fashion Valley T.C. **ARRIVE**
—	—	4:50a	4:58a	5:13a
—	—	5:20	5:28	5:43
—	—	5:50	5:58	6:13
6:11a	6:15a	6:20	6:28	6:43
6:37	6:42	6:48	6:57	7:13
7:07	7:12	7:18	7:27	7:43
7:37	7:42	7:48	7:57	8:13
8:07	8:12	8:18	8:27	8:43
8:37	8:42	8:48	8:57	9:13
9:07	9:12	9:18	9:27	9:43
9:37	9:42	9:48	9:57	10:13
10:07	10:12	10:18	10:27	10:43
10:37	10:42	10:48	10:57	11:13
11:05	11:10	11:17	11:27	11:43
11:35	11:40	11:47	11:57	**12:13p**
12:03p	**12:08p**	**12:15p**	**12:27p**	**12:43**
12:33	**12:38**	**12:45**	**12:57**	**1:13**
1:03	**1:08**	**1:15**	**1:27**	**1:43**
1:33	**1:38**	**1:45**	**1:57**	**2:13**
2:03	**2:08**	**2:15**	**2:27**	**2:43**
2:33	**2:38**	**2:45**	**2:57**	**3:13**
3:05	**3:10**	**3:17**	**3:27**	**3:43**
3:35	**3:40**	**3:47**	**3:57**	**4:13**
4:05	**4:10**	**4:17**	**4:27**	**4:43**
4:35	**4:40**	**4:47**	**4:57**	**5:13**
5:05	**5:10**	**5:17**	**5:27**	**5:43**
5:35	**5:40**	**5:47**	**5:57**	**6:13**
6:05	**6:10**	**6:17**	**6:27**	**6:43**
6:40	**6:45**	**6:51**	**7:00**	**7:15**
7:51	**7:56**	**8:02**	**8:11**	**8:26**
—	—	**9:03**	**9:11**	**9:26**

Route 928 — Saturday* / *sábado**

Fashion Valley ➡ Kearny Mesa

(A) Fashion Valley T.C. **DEPART**	(D) Murray Ridge & Sandrock	(E) Stone-crest Plaza	(H) Ruffin Rd. & Balboa Ave.	(I) Kearny Mesa T.C. **ARRIVE**
7:08a	7:20a	7:30a	—	—
8:08	8:20	8:30	—	—
9:08	9:20	9:30	—	—
10:08	10:20	10:30	—	—
11:08	11:20	11:30	—	—
12:08p	**12:22p**	**12:32p**	—	—
1:08	**1:22**	**1:32**	—	—
2:08	**2:22**	**2:32**	—	—
3:08	**3:22**	**3:32**	—	—
4:08	**4:22**	**4:32**	—	—
5:08	**5:22**	**5:32**	—	—
6:08	**6:22**	**6:32**	—	—
7:09	**7:22**	**7:32**	—	—
8:09	**8:22**	**8:32**	—	—
9:09	**9:21**	**9:31**	—	—

Kearny Mesa ➡ Fashion Valley

(I) Kearny Mesa T.C. **DEPART**	(H) Ruffin Rd. & Balboa Ave.	(E) Stone-crest Plaza	(D) Murray Ridge & Sandrock	(A) Fashion Valley T.C. **ARRIVE**
—	—	6:34a	6:43a	6:58a
—	—	7:34	7:43	7:58
—	—	8:34	8:43	8:58
—	—	9:34	9:43	9:58
—	—	10:33	10:43	10:59
—	—	11:33	11:43	11:59
—	—	**12:33p**	**12:43p**	**12:59p**
—	—	**1:33**	**1:43**	**1:59**
—	—	**2:33**	**2:43**	**2:59**
—	—	**3:33**	**3:43**	**3:59**
—	—	**4:33**	**4:43**	**4:59**
—	—	**5:33**	**5:43**	**5:59**

Route 928 — Sunday* / *domingo**

Fashion Valley ➡ Kearny Mesa

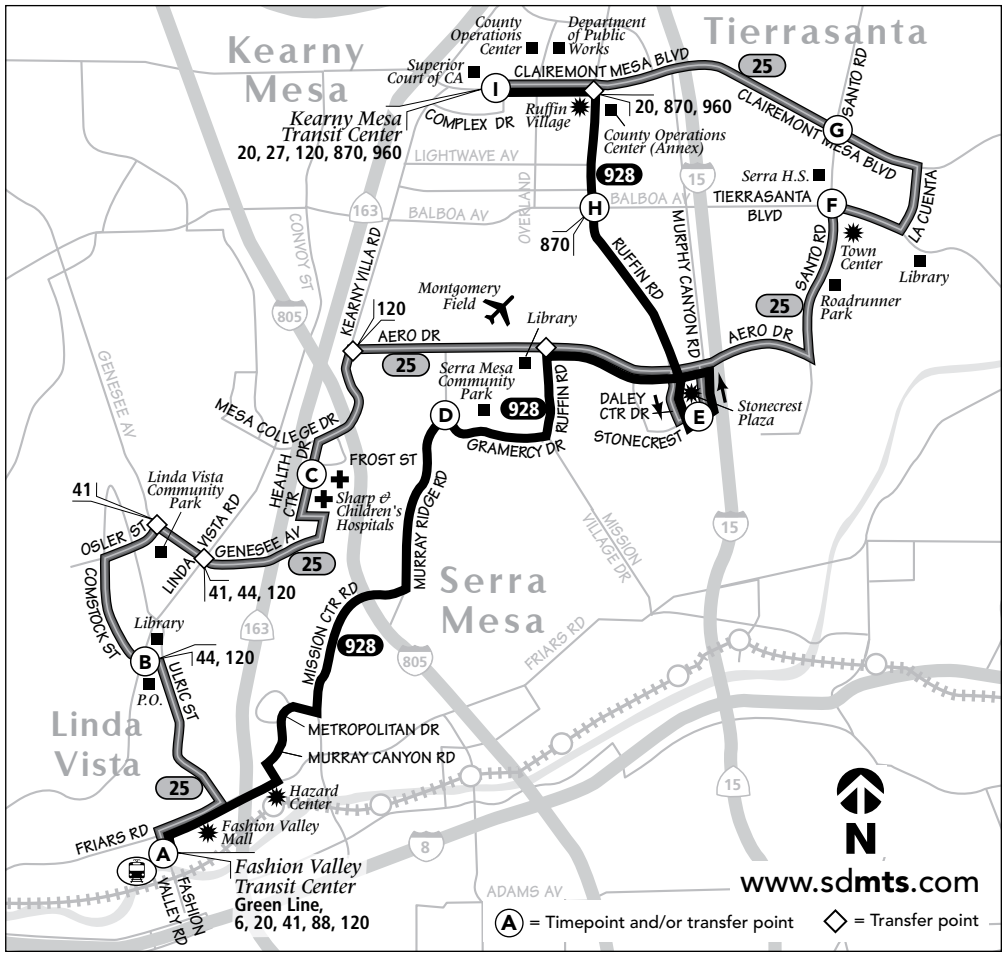
(A) Fashion Valley T.C. **DEPART**	(D) Murray Ridge & Sandrock	(E) Stone-crest Plaza	(H) Ruffin Rd. & Balboa Ave.	(I) Kearny Mesa Transit Ctr. **ARRIVE**
9:08a	9:20a	9:30a	—	—
10:08	10:20	10:30	—	—
11:08	11:20	11:30	—	—
12:08p	**12:22p**	**12:32p**	—	—
1:08	**1:22**	**1:32**	—	—
2:08	**2:22**	**2:32**	—	—
3:08	**3:22**	**3:32**	—	—
4:08	**4:22**	**4:32**	—	—
5:08	**5:22**	**5:32**	—	—
6:08	**6:22**	**6:32**	—	—

Kearny Mesa ➡ Fashion Valley

(I) Kearny Mesa Transit Ctr.• **DEPART**	(H) Ruffin Rd. & Balboa Ave.	(E) Stone-crest Plaza	(D) Murray Ridge & Sandrock	(A) Fashion Valley T.C. **ARRIVE**
—	—	8:34a	8:43a	8:58a
—	—	9:34	9:43	9:58
—	—	10:33	10:43	10:59
—	—	11:33	11:43	11:59
—	—	**12:33p**	**12:43p**	**12:59p**
—	—	**1:33**	**1:43**	**1:59**
—	—	**2:33**	**2:43**	**2:59**
—	—	**3:33**	**3:43**	**3:59**
—	—	**4:33**	**4:43**	**4:59**
—	—	**5:33**	**5:43**	**5:59**

• = Board bus on Clairemont Mesa Blvd. in front of Spice House Restaurant
Encuentra el autobús en Clairemont Mesa Blvd. en frente del restaurante Spice House

*A Saturday or Sunday schedule will be operated on most holidays and observed holidays, including New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas. For holiday service details, visit www.sdmts.com or call 511. / *Se operará con horario de sábado o domingo durante la mayoría de los días festivos y los feriados observados. Los días festivos incluyen Año Nuevo, Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias y Navidad. Para detalles sobre el servicio en días festivos, visite www.sdmts.com o llame al 511.*



Effective JUNE 10, 2012

27

Pacific Beach – Kearny Mesa

via Balboa Ave.

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*

Day Pass (Regional) / *Pase diario (Regional)*	**$5.00**
One-Way Fare / *Tarifa de una direccíon*	**$2.25**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$1.10***
Children 5 & under / *Niños de 5 años o menos* Up to two children ride free per paying adult / *Máximo dos niños viajan gratis por cada adulto*	**FREE** / ***GRATIS***

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	**$72.00**
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	**$18.00***
Youths (18 and under) *Jóvenes (18 años o menos)*	**$36.00***

*I.D. required for discount fare or pass.
**Se requiere identificación para tarifas o pases de descuento.*

DAY PASS (REGIONAL) / ***Pase diario (Regional)***

Valid for unlimited travel for one person on Trolley, most MTS buses, NCTD BREEZE and SPRINTER. Valid for a discount on COASTER fares. Not valid on Premium Express, Rural, Access, or special service buses.

Válidos para viajes ilimitados de una sola persona para: el Trolley, la mayoría de los autobuses de MTS, y los servicios del NCTD de BREEZE y SPRINTER. Válidos para acceder a descuentos en el COASTER, pero no para las rutas Premium Express, rurales, Access, ni los servicios especiales.

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	**511** or/ó **(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005** or/ó **(888) 722-4889**
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
SafeWatch	**(619) 557-4500**
Lost & Found *Objetos extraviados*	**(619) 427-5660** or/ó **(800) 409-3310**
The Transit Store	**(619) 234-1060** 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**www.sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at The Transit Store, or visit **www.sdmts.com**.

*Para obtener más información sobre el uso de los servicios de MTS, recoga un 'Rider's Guide' en un autobús o en The Transit Store, o visita a **www.sdmts.com**.*

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

DESTINATIONS

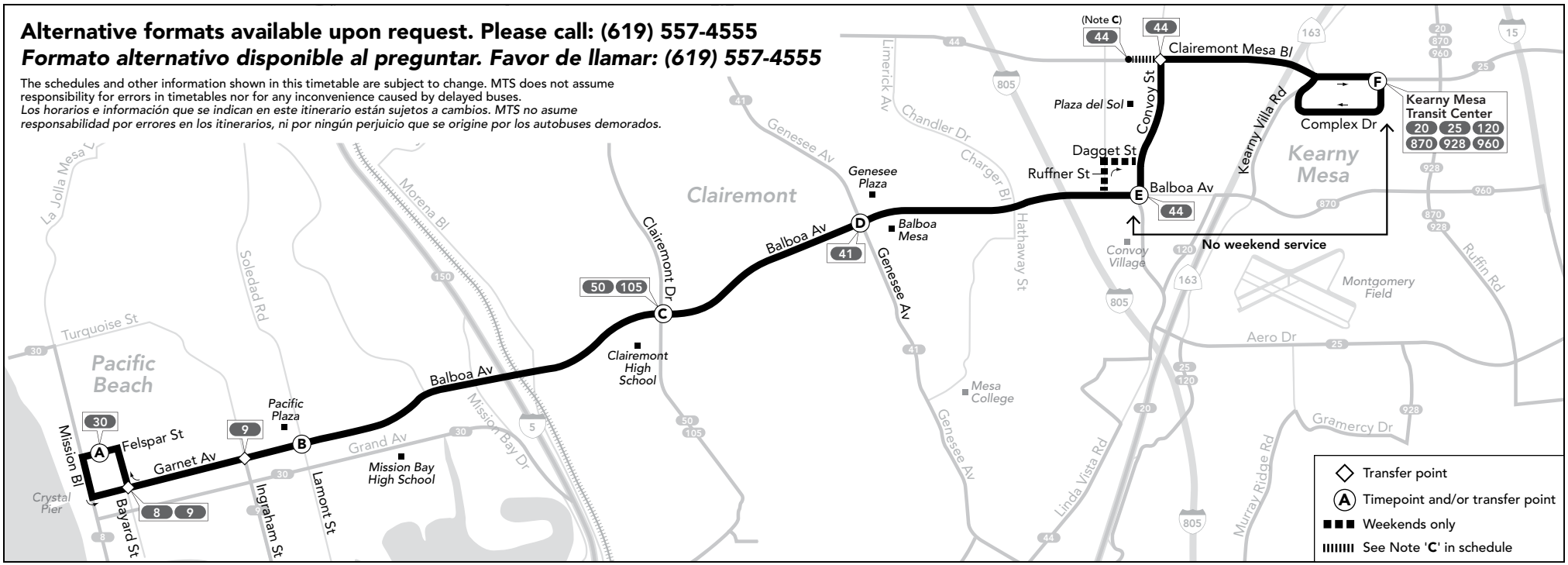
- Balboa Ave.
- Clairemont High School
- Crystal Pier
- Garnet Ave.
- Genesee Plaza

MTS Metropolitan Transit System

Alternative formats available upon request. Please call: (619) 557-4555

Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.
Los horarios e información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.



A Saturday or Sunday schedule will be operated on the following holidays and observed holidays
Se operará con horario de sábado o domingo durante los siguientes días festivos y feriados observados >>> New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

Route 27 – Monday through Friday / *lunes a viernes*

Pacific Beach ➡ Clairemont ➡ Kearny Mesa

Ⓐ Felspar St. & Mission Bl. **DEPART**	Ⓑ Garnet Ave. & Lamont St.	Ⓒ Balboa Ave. & Clairemont Dr.	Ⓓ Balboa Ave. & Genesee Ave.	Ⓔ Convoy St. & Balboa Ave.	Ⓕ Kearny Mesa Transit Center **ARRIVE**
—	—	—	—	— **C** 5:30a	5:35a
—	—	—	—	— **C** 5:53	5:58
5:55a	6:00a	6:08a	6:11a	6:19a	6:28
6:25	6:30	6:38	6:41	6:49	6:58
6:48	6:54	7:04	7:09	7:18	7:28
7:18	7:24	7:34	7:39	7:48	7:58
7:48	7:54	8:04	8:09	8:18	8:28
8:19	8:25	8:34	8:38	8:47	8:58
8:49	8:55	9:04	9:08	9:17	9:28
9:19	9:25	9:34	9:38	9:47	9:58
9:49	9:55	10:04	10:08	10:17	10:28
10:19	10:25	10:34	10:38	10:47	10:58
10:49	10:55	11:04	11:08	11:17	11:28
11:14	11:21	11:31	11:35	11:45	11:57
11:44	11:51	**12:01p**	**12:05p**	**12:15p**	**12:27p**
12:14p	**12:21p**	**12:31**	**12:35**	**12:45**	**12:57**
12:44	**12:51**	**1:01**	**1:05**	**1:15**	**1:27**
1:14	**1:21**	**1:31**	**1:35**	**1:45**	**1:57**
1:44	**1:51**	**2:01**	**2:05**	**2:15**	**2:27**
2:14	**2:21**	**2:31**	**2:35**	**2:45**	**2:57**
2:40	**2:48**	**2:59**	**3:04**	**3:14**	**3:27**
3:10	**3:18**	**3:29**	**3:34**	**3:44**	**3:57**
3:40	**3:48**	**3:59**	**4:04**	**4:14**	**4:27**
4:10	**4:18**	**4:29**	**4:34**	**4:44**	**4:57**
4:40	**4:48**	**4:59**	**5:04**	**5:14**	**5:27**
5:10	**5:18**	**5:29**	**5:34**	**5:44**	**5:57**
5:44	**5:52**	**6:02**	**6:06**	**6:15**	**6:27**
6:14	**6:22**	**6:32**	**6:36**	**6:45**	**6:57**
6:39	**6:46**	**6:55**	**6:59**	**7:08**	**7:19**
7:27	**7:33**	**7:41**	**7:45**	**7:54**	**8:04**
8:27	**8:33**	**8:41**	**8:45**	**8:54**	**9:04**
9:27	**9:33**	**9:41**	**9:45**	**9:54**	**10:04**

Kearny Mesa ➡ Clairemont ➡ Pacific Beach

Ⓕ Kearny Mesa Transit Center **DEPART**	Ⓔ Convoy St. & Balboa Ave.	Ⓓ Balboa Ave. & Genesee Ave.	Ⓒ Balboa Ave. & Clairemont Dr.	Ⓑ Garnet Ave. & Lamont St.	Ⓐ Felspar St. & Mission Bl. **ARRIVE**
5:46a ▲	5:55a	6:02a	6:05a	6:11a	6:17a
6:10 ▲	6:20	6:27	6:31	6:38	6:45
6:40 ▲	6:50	6:57	7:01	7:08	7:15
7:10 ▲	7:21	7:29	7:33	7:41	7:49
7:40 ▲	7:51	7:59	8:03	8:11	8:19
8:10 ▲	8:21	8:29	8:33	8:41	8:49
8:40 ▲	8:51	8:59	9:03	9:11	9:19
9:12 ▲	9:22	9:30	9:34	9:41	9:49
9:42 ▲	9:52	10:00	10:04	10:11	10:19
10:12 ▲	10:22	10:30	10:34	10:41	10:49
10:42 ▲	10:52	11:00	11:04	11:11	11:19
11:12 ▲	11:23	11:32	11:36	11:44	11:53
11:42 ▲	11:53	**12:02p**	**12:06p**	**12:14p**	**12:23p**
12:12p ▲	**12:23p**	**12:32**	**12:36**	**12:44**	**12:53**
12:42 ▲	**12:53**	**1:02**	**1:06**	**1:14**	**1:23**
1:12 ▲	**1:23**	**1:32**	**1:36**	**1:44**	**1:53**
1:42 ▲	**1:53**	**2:02**	**2:06**	**2:14**	**2:23**
2:12 ▲	**2:23**	**2:32**	**2:36**	**2:44**	**2:53**
2:42 ▲	**2:54**	**3:03**	**3:08**	**3:17**	**3:27**
3:12 ▲	**3:24**	**3:33**	**3:38**	**3:47**	**3:57**
3:42 ▲	**3:54**	**4:03**	**4:08**	**4:17**	**4:27**
4:12 ▲	**4:24**	**4:33**	**4:38**	**4:47**	**4:57**
4:42 ▲	**4:54**	**5:03**	**5:08**	**5:17**	**5:27**
5:12 ▲	**5:24**	**5:33**	**5:38**	**5:47**	**5:57**
5:46 ▲	**5:57**	**6:05**	**6:09**	**6:18**	**6:27**
6:16 ▲	**6:26**	**6:33**	**6:37**	**6:45**	**6:53**
6:46 ▲	**6:55**	**7:02**	**7:06**	**7:13**	**7:21**
7:27 ▲	**7:36**	**7:43**	**7:47**	**7:54**	**8:02**
8:27 ▲	**8:36**	**8:43**	**8:47**	**8:54**	**9:02**

Route 27 – Saturday / *sábado*

Pacific Beach ➡ Clairemont ➡ Kearny Mesa

Ⓐ Felspar St. & Mission Bl. **DEPART**	Ⓑ Garnet Ave. & Lamont St.	Ⓒ Balboa Ave. & Clairemont Dr.	Ⓓ Balboa Ave. & Genesee Ave.	Ⓔ Convoy St. & Balboa Ave.	Ⓕ Kearny Mesa Transit Center **ARRIVE**
6:21a	6:26a	6:33a	6:36a	6:45a	—
7:21	7:26	7:33	7:36	7:45	—
8:21	8:27	8:35	8:39	8:48	—
9:20	9:27	9:36	9:40	9:49	—
10:20	10:27	10:36	10:40	10:50	—
11:20	11:27	11:36	11:40	11:50	—
12:17p	**12:26p**	**12:36p**	**12:40p**	**12:50p**	**—**
1:17	**1:26**	**1:36**	**1:40**	**1:50**	**—**
2:17	**2:26**	**2:36**	**2:40**	**2:50**	**—**
3:17	**3:26**	**3:36**	**3:40**	**3:50**	**—**
4:17	**4:26**	**4:36**	**4:40**	**4:50**	**—**
5:19	**5:27**	**5:36**	**5:40**	**5:50**	**—**
6:19	**6:27**	**6:36**	**6:40**	**6:49**	**—**
7:21	**7:28**	**7:37**	**7:40**	**7:49**	**—**

Kearny Mesa ➡ Clairemont ➡ Pacific Beach

Ⓕ Kearny Mesa Transit Center **DEPART**	Ⓔ Convoy St. & Balboa Ave.	Ⓓ Balboa Ave. & Genesee Ave.	Ⓒ Balboa Ave. & Clairemont Dr.	Ⓑ Garnet Ave. & Lamont St.	Ⓐ Felspar St. & Mission Bl. **ARRIVE**
—	7:11a	7:19a	7:22a	7:28a	7:34a
—	8:11	8:19	8:22	8:29	8:37
—	9:12	9:20	9:24	9:32	9:41
—	10:12	10:20	10:24	10:32	10:41
—	11:12	11:20	11:24	11:32	11:41
—	**12:11p**	**12:19p**	**12:23p**	**12:31p**	**12:41p**
—	**1:11**	**1:19**	**1:23**	**1:31**	**1:41**
—	**2:11**	**2:19**	**2:23**	**2:31**	**2:41**
—	**3:11**	**3:19**	**3:23**	**3:31**	**3:41**
—	**4:12**	**4:20**	**4:24**	**4:32**	**4:41**
—	**5:12**	**5:20**	**5:24**	**5:32**	**5:41**
—	**6:13**	**6:21**	**6:25**	**6:32**	**6:41**
—	**7:13**	**7:21**	**7:25**	**7:32**	**7:41**

Route 27 – Sunday / *domingo*

Pacific Beach ➡ Clairemont ➡ Kearny Mesa

Ⓐ Felspar St. & Mission Bl. **DEPART**	Ⓑ Garnet Ave. & Lamont St.	Ⓒ Balboa Ave. & Clairemont Dr.	Ⓓ Balboa Ave. & Genesee Ave.	Ⓔ Convoy St. & Balboa Ave.	Ⓕ Kearny Mesa Transit Center **ARRIVE**
10:10a	10:17a	10:26a	10:30a	10:40a	—
11:10	11:17	11:26	11:30	11:40	—
12:10p	**12:19p**	**12:29p**	**12:33p**	**12:43p**	**—**
1:10	**1:19**	**1:29**	**1:33**	**1:43**	**—**
2:10	**2:19**	**2:29**	**2:33**	**2:43**	**—**
3:10	**3:19**	**3:29**	**3:33**	**3:43**	**—**
4:10	**4:19**	**4:29**	**4:33**	**4:43**	**—**
5:10	**5:18**	**5:27**	**5:31**	**5:41**	**—**
6:10	**6:18**	**6:27**	**6:31**	**6:40**	**—**

Kearny Mesa ➡ Clairemont ➡ Pacific Beach

Ⓕ Kearny Mesa Transit Center **DEPART**	Ⓔ Convoy St. & Balboa Ave.	Ⓓ Balboa Ave. & Genesee Ave.	Ⓒ Balboa Ave. & Clairemont Dr.	Ⓑ Garnet Ave. & Lamont St.	Ⓐ Felspar St. & Mission Bl. **ARRIVE**
—	9:08a	9:16a	9:20a	9:28a	9:37a
—	10:00	10:08	10:12	10:20	10:29
—	11:00	11:08	11:12	11:20	11:29
—	**12:00p**	**12:08p**	**12:12p**	**12:20p**	**12:30p**
—	**1:00**	**1:08**	**1:12**	**1:20**	**1:30**
—	**2:00**	**2:08**	**2:12**	**2:20**	**2:30**
—	**3:00**	**3:08**	**3:12**	**3:20**	**3:30**
—	**4:00**	**4:08**	**4:12**	**4:20**	**4:29**
—	**5:00**	**5:08**	**5:12**	**5:20**	**5:29**

▲ = Board bus on Complex Drive next to Bank of America. / *Encuentra el autobús en Complex Drive al lado de Bank of America.*
C = Trip begins on Clairemont Mesa Blvd. at Convoy Street. / *Viaje comienza en Clairemont Mesa Blvd. y la esquina de Convoy Street.*

Effective JUNE 13, 2010

120

Downtown – Kearny Mesa Transit Center

via Hillcrest / Fashion Valley / Linda Vista

AWARDED OUTSTANDING PUBLIC TRANSIT SYSTEM MTS

DESTINATIONS

- Fashion Valley Mall
- Horton Plaza
- Juvenile Hall
- Kearny Mesa Courthouse
- Mercy Hospital
- Sharp & Children's Hospitals

TROLLEY CONNECTIONS
5th Avenue
Fashion Valley

MTS Metropolitan Transit System

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*	
Day Pass (Regional) / *Pase diario (Regional)*	$5.00
One-Way Fare / *Tarifa de una direccíon*	$2.25
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.10*
Children 5 & under / *Niños de 5 años o menores*	FREE / *GRATIS**

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menores)*	$36.00*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

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* I.D. required for discount fare or pass.
** Se requiere identificación para tarifas o pases de descuento.*

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	(619) 557-4555
SafeWatch	(619) 557-4500
The Transit Store / Lost & Found *The Transit Store / Objetos extraviados*	(619) 234-1060
Articles found on the bus are turned in at The Transit Store *Artículos encontrados en los autobuses son entregados a The Transit Store*	1st & Broadway Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	www.sdmts.com

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Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Route 120 — Sunday* / *domingo**

Downtown ➡ Hillcrest ➡ Fashion Valley ➡ Kearny Mesa

(A) 4th Ave. & G St. DEPART	(B) 5th Ave. & Broadway	(C) 5th Ave. & University Ave.	(D) Fashion Valley Transit Center ARRIVE	(D) Fashion Valley Transit Center DEPART	(E) Comstock St. & Linda Vista Rd.	(F) Sharp Hospital (Health Center & Frost)	(G) Kearny Mesa Transit Center ARRIVE
Alternate Sunday 4th & G service available on Route 11 *Servicio dominical alterno a la 4ª y G, por la ruta 11*	6:09a	6:21a	6:30a	6:38a	6:45a	6:53a	Alternate Sunday Kearny Mesa Transit Center service available on Route 20 *Servicio dominical alterno para Kearny Mesa Transit Center, por la ruta 20*
	7:08	7:21	7:30	7:38	7:45	7:54	
	8:08	8:22	8:32	8:39	8:47	8:56	
	9:08	9:23	9:33	9:39	9:47	9:56	
	9:38	9:53	10:03	—	—	—	
	10:08	10:23	10:33	10:39	10:47	10:56	
	10:38	10:53	11:03	—	—	—	
	11:08	11:23	11:33	11:39	11:47	11:56	
	11:38	11:53	**12:03p**	—	—	—	
	12:08p	**12:23p**	**12:33**	**12:39p**	**12:47p**	**12:56p**	
	12:38	**12:53**	**1:03**	—	—	—	
	1:08	**1:23**	**1:33**	**1:39**	**1:47**	**1:56**	
	1:38	**1:53**	**2:03**	—	—	—	
	2:08	**2:23**	**2:33**	**2:39**	**2:47**	**2:56**	
	2:38	**2:53**	**3:03**	—	—	—	
	3:08	**3:23**	**3:33**	**3:39**	**3:47**	**3:56**	
	3:38	**3:53**	**4:03**	—	—	—	
	4:08	**4:23**	**4:33**	**4:39**	**4:47**	**4:56**	
	4:38	**4:53**	**5:03**	—	—	—	
	5:08	**5:23**	**5:33**	**5:39**	**5:47**	**5:56**	
	5:38	**5:53**	**6:03**	—	—	—	
	6:08	**6:22**	**6:32**	**6:39**	**6:47**	**6:56**	
	7:08	**7:22**	**7:32**	**7:39**	**7:47**	**7:56**	
	8:08	**8:21**	**8:30**	**8:38**	**8:46**	**8:54**	
	9:09	**9:21**	**9:30**	**9:38**	**9:45**	**9:52**	

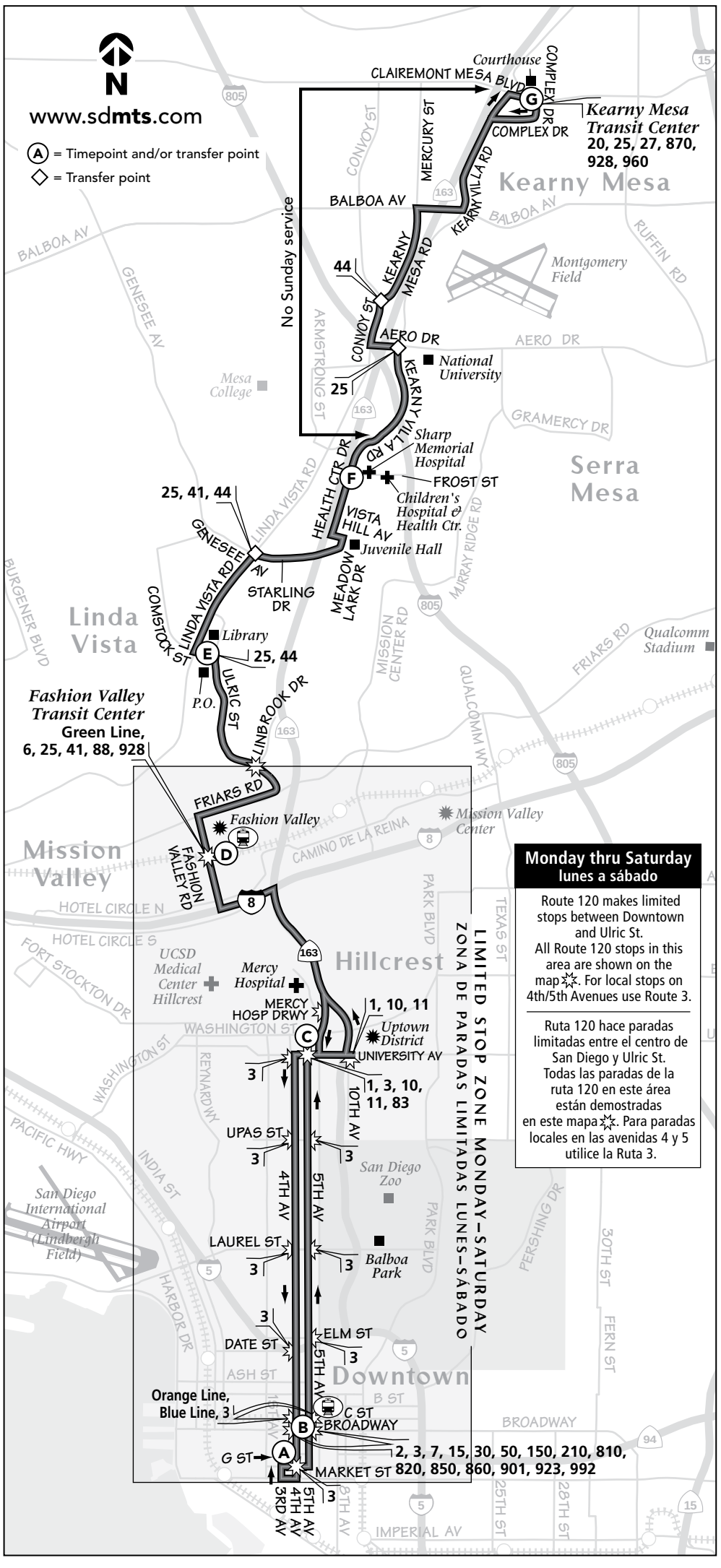
LIMITED STOP ZONE / *ZONA DE PARADAS LIMITADAS*

Route 120 — Sunday* / *domingo**

Kearny Mesa ➡ Fashion Valley ➡ Hillcrest ➡ Downtown

(G) Kearny Mesa Transit Center DEPART	(F) Sharp Hospital (Health Center & Frost)	(E) Comstock St. & Linda Vista Rd.	(D) Fashion Valley Transit Center ARRIVE	(D) Fashion Valley Transit Center DEPART	(C) University Ave. & 5th Ave.	(B) 4th Ave. & Broadway	(A) 4th Ave. & G St. ARRIVE
Alternate Sunday Kearny Mesa Transit Center service available on Route 20 *Servicio dominical alterno para Kearny Mesa Transit Center, por la ruta 20*	6:14a	6:22a	6:29a	6:37a	6:43a	6:56a	Alternate Sunday 4th & G service available on Routes 3 and 11 *Servicio dominical alterno a la 4ª y G, por las rutas 3 y 11*
	7:14	7:22	7:29	7:37	7:43	7:56	
	8:14	8:22	8:29	8:37	8:43	8:56	
	9:12	9:21	9:29	9:37	9:44	9:58	
	—	—	—	10:07	10:15	10:30	
	10:11	10:21	10:29	10:37	10:45	11:00	
	—	—	—	11:07	11:15	11:31	
	11:10	11:20	11:29	11:37	11:45	**12:01p**	
	—	—	—	**12:07p**	**12:15p**	**12:31**	
	12:10p	**12:20p**	**12:29p**	**12:37**	**12:45**	**1:01**	
	—	—	—	**1:07**	**1:15**	**1:31**	
	1:10	**1:20**	**1:29**	**1:37**	**1:45**	**2:01**	
	—	—	—	**2:07**	**2:15**	**2:31**	
	2:10	**2:20**	**2:29**	**2:37**	**2:45**	**3:01**	
	—	—	—	**3:07**	**3:15**	**3:31**	
	3:10	**3:20**	**3:29**	**3:37**	**3:45**	**4:01**	
	—	—	—	**4:07**	**4:15**	**4:31**	
	4:10	**4:20**	**4:29**	**4:37**	**4:45**	**5:01**	
	—	—	—	**5:07**	**5:15**	**5:30**	
	5:10	**5:20**	**5:29**	**5:37**	**5:45**	**6:00**	
	—	—	—	**6:07**	**6:14**	**6:28**	
	6:12	**6:21**	**6:29**	**6:37**	**6:44**	**6:58**	
	7:12	**7:21**	**7:29**	**7:37**	**7:44**	**7:58**	
	8:14	**8:22**	**8:29**	**8:37**	**8:43**	**8:56**	
	9:14	**9:22**	**9:29**	**9:37**	**9:43**	**9:55**	

LIMITED STOP ZONE / *ZONA DE PARADAS LIMITADAS*



***A Saturday or Sunday schedule will be operated on most holidays and observed holidays, including New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas. For holiday service details, visit www.sdmts.com or call 511.**
**Se operará con horario de sábado o domingo durante la mayoría de los días festivos y los días de asueto a guardar. Los días festivos incluyen Año Nuevo, Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias y Navidad. Para detalles sobre el servicio en días festivos, visite www.sdmts.com o llame al 511.*

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.
Los horarios y información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

Alternative formats are available upon request. Please call: / *Formato alternativo disponible al preguntar. Favor de llamar:* (619) 231-1466

Route 120

Monday through Friday / *lunes a viernes*

Downtown ➡ Hillcrest ➡ Fashion Valley ➡ Kearny Mesa

Ⓐ 4th Ave. & G St. DEPART	Ⓑ 5th Ave. & Broadway	Ⓒ 5th Ave. & University Ave.	Ⓓ Fashion Valley Transit Center ARRIVE	Ⓓ Fashion Valley Transit Center DEPART	Ⓔ Comstock St. & Linda Vista Rd.	Ⓕ Sharp Hospital (Health Center & Frost)	Ⓖ Kearny Mesa Transit Center ARRIVE
4:58a	5:00a	5:10a	5:18a	5:24a	5:30a	5:39a	5:52a
5:28	5:30	5:40	5:48	5:54	6:00	6:09	6:22
5:57	5:59	6:09	6:18	6:21	6:28	6:37	6:52
6:19	6:21	6:31	6:40	—	—	—	—
6:34	6:36	6:46	6:55	6:58	7:05	7:14	7:29
6:49	6:51	7:01	7:10	—	—	—	—
7:03	7:05	7:16	7:25	7:28	7:35	7:46	8:01
7:18	7:20	7:31	7:40	—	—	—	—
7:31	7:34	7:45	7:55	7:58	8:05	8:17	8:32
7:46	7:49	8:00	8:10	—	—	—	—
8:01	8:04	8:15	8:25	8:28	8:35	8:47	9:02
8:16	8:19	8:30	8:40	—	—	—	—
8:31	8:34	8:45	8:55	8:58	9:05	9:17	9:32
8:46	8:49	9:00	9:10	—	—	—	—
9:01	9:04	9:15	9:25	9:28	9:35	9:47	10:02
9:16	9:19	9:30	9:40	—	—	—	—
9:31	9:34	9:45	9:55	9:58	10:05	10:17	10:32
9:46	9:49	10:00	10:10	—	—	—	—
10:01	10:04	10:15	10:25	10:28	10:35	10:47	11:02
10:16	10:19	10:30	10:40	—	—	—	—
10:31	10:34	10:45	10:55	10:58	11:05	11:17	11:32
10:46	10:49	11:00	11:10	—	—	—	—
11:00	11:03	11:15	11:25	11:28	11:36	11:48	**12:03**
11:15	11:18	11:30	11:40	—	—	—	**—**
11:30	11:33	11:45	11:55	11:58	**12:06p**	**12:18p**	**12:33p**
11:45	11:48	**12:00p**	**12:10p**	**—**	**—**	**—**	**—**
12:00p	**12:03p**	**12:15**	**12:25**	**12:28p**	**12:36**	**12:48**	**1:03**
12:15	**12:18**	**12:30**	**12:40**	**—**	**—**	**—**	**—**
12:30	**12:33**	**12:45**	**12:55**	**12:58**	**1:06**	**1:18**	**1:33**
12:45	**12:48**	**1:00**	**1:10**	**—**	**—**	**—**	**—**
1:00	**1:03**	**1:15**	**1:25**	**1:28**	**1:36**	**1:48**	**2:03**
1:15	**1:18**	**1:30**	**1:40**	**—**	**—**	**—**	**—**
1:29	**1:32**	**1:44**	**1:55**	**1:58**	**2:07**	**2:19**	**2:36**
1:44	**1:47**	**1:59**	**2:10**	**—**	**—**	**—**	**—**
1:59	**2:02**	**2:14**	**2:25**	**2:28**	**2:37**	**2:49**	**3:06**
2:14	**2:17**	**2:29**	**2:40**	**—**	**—**	**—**	**—**
2:29	**2:32**	**2:44**	**2:55**	**2:58**	**3:07**	**3:19**	**3:36**
2:44	**2:47**	**2:59**	**3:10**	**—**	**—**	**—**	**—**
2:59	**3:02**	**3:14**	**3:25**	**3:28**	**3:37**	**3:49**	**4:06**
3:14	**3:17**	**3:29**	**3:40**	**—**	**—**	**—**	**—**
3:29	**3:32**	**3:44**	**3:55**	**3:58**	**4:07**	**4:19**	**4:36**
3:44	**3:47**	**3:59**	**4:10**	**—**	**—**	**—**	**—**
3:59	**4:02**	**4:14**	**4:25**	**4:28**	**4:37**	**4:49**	**5:06**
4:14	**4:17**	**4:29**	**4:40**	**—**	**—**	**—**	**—**
4:29	**4:32**	**4:44**	**4:55**	**4:58**	**5:07**	**5:19**	**5:36**
4:44	**4:47**	**4:59**	**5:10**	**—**	**—**	**—**	**—**
4:59	**5:02**	**5:14**	**5:25**	**5:28**	**5:37**	**5:49**	**6:06**
5:14	**5:17**	**5:29**	**5:40**	**—**	**—**	**—**	**—**
5:29	**5:32**	**5:44**	**5:55**	**5:58**	**6:07**	**6:19**	**6:36**
5:45	**5:48**	**6:00**	**6:10**	**—**	**—**	**—**	**—**
6:00	**6:03**	**6:15**	**6:25**	**6:28**	**6:36**	**6:48**	**7:03**
6:31	**6:34**	**6:45**	**6:55**	**6:58**	**7:06**	**7:17**	**7:31**
7:01	**7:04**	**7:15**	**7:25**	**7:28**	**7:35**	**7:45**	**7:58**
7:32	**7:35**	**7:45**	**7:55**	**7:58**	**8:04**	**8:13**	**8:25**
8:02	**8:05**	**8:15**	**8:25**	**8:28**	**8:34**	**8:43**	**8:55**
8:32	**8:35**	**8:45**	**8:55**	**8:58**	**9:04**	**9:13**	**9:25**
9:02	**9:05**	**9:15**	**9:25**	**9:28**	**9:34**	**9:43**	**9:55**
9:34	**9:36**	**9:46**	**9:55**	**9:58**	**10:04**	**10:12**	**10:23**
10:04	**10:06**	**10:16**	**10:25**	**10:28**	**10:34**	**10:42**	**10:53**
10:38	**10:40**	**10:50**	**10:59**	**—**	**—**	**—**	**—**
11:08	**11:10**	**11:20**	**11:29**	**—**	**—**	**—**	**—**

LIMITED STOP ZONE / *ZONA DE PARADAS LIMITADAS*

Kearny Mesa ➡ Fashion Valley ➡ Hillcrest ➡ Downtown

Ⓖ Kearny Mesa Transit Center DEPART	Ⓕ Sharp Hospital (Health Center & Frost)	Ⓔ Comstock St. & Linda Vista Rd.	Ⓓ Fashion Valley Transit Center ARRIVE	Ⓓ Fashion Valley Transit Center DEPART	Ⓒ University Ave. & 5th Ave.	Ⓑ 4th Ave. & Broadway	Ⓐ 4th Ave. & G St. ARRIVE
5:33a	5:43a	5:53a	6:00a	6:05a	6:11a	6:22a	6:24a
6:03	6:13	6:23	6:30	6:35	6:41	6:52	6:54
—	—	—	—	6:46	6:52	7:03	7:05
6:29	6:39	6:49	6:56	7:01	7:07	7:18	7:20
—	—	—	—	7:16	7:22	7:34	7:36
6:58	7:10	7:21	7:29	7:32	7:38	7:50	7:52
—	—	—	—	7:46	7:53	8:06	8:08
7:23	7:38	7:50	7:58	8:01	8:08	8:21	8:23
—	—	—	—	8:16	8:23	8:36	8:38
7:53	8:08	8:20	8:28	8:31	8:38	8:51	8:53
—	—	—	—	8:46	8:53	9:06	9:08
8:23	8:38	8:50	8:58	9:01	9:08	9:21	9:23
—	—	—	—	9:16	9:23	9:36	9:38
8:53	9:08	9:20	9:28	9:31	9:38	9:51	9:53
—	—	—	—	9:46	9:53	10:06	10:08
9:23	9:38	9:50	9:58	10:01	10:08	10:21	10:23
—	—	—	—	10:16	10:23	10:36	10:38
9:55	10:09	10:20	10:28	10:31	10:38	10:51	10:53
—	—	—	—	10:46	10:53	11:06	11:08
10:25	10:39	10:50	10:58	11:01	11:08	11:21	11:23
—	—	—	—	11:16	11:23	11:36	11:38
10:55	11:09	11:20	11:28	11:31	11:38	11:51	11:53
—	—	—	—	11:46	11:53	**12:06p**	**12:08p**
11:25	11:39	11:50	11:58	**12:01p**	**12:08p**	**12:21**	**12:23**
—	—	—	—	**12:16**	**12:23**	**12:36**	**12:38**
11:55	**12:09p**	**12:20p**	**12:28p**	**12:31**	**12:38**	**12:51**	**12:53**
—	**—**	**—**	**—**	**12:46**	**12:53**	**1:06**	**1:08**
12:21p	**12:36**	**12:48**	**12:58**	**1:01**	**1:08**	**1:21**	**1:23**
—	**—**	**—**	**—**	**1:16**	**1:23**	**1:36**	**1:38**
12:51	**1:06**	**1:18**	**1:28**	**1:31**	**1:38**	**1:51**	**1:53**
—	**—**	**—**	**—**	**1:46**	**1:53**	**2:06**	**2:08**
1:21	**1:36**	**1:48**	**1:58**	**2:01**	**2:08**	**2:21**	**2:23**
—	**—**	**—**	**—**	**2:16**	**2:23**	**2:36**	**2:38**
1:51	**2:06**	**2:18**	**2:28**	**2:31**	**2:38**	**2:51**	**2:53**
—	**—**	**—**	**—**	**2:46**	**2:53**	**3:06**	**3:08**
2:20	**2:35**	**2:47**	**2:57**	**3:00**	**3:07**	**3:20**	**3:22**
—	**—**	**—**	**—**	**3:15**	**3:22**	**3:35**	**3:37**
2:48	**3:04**	**3:17**	**3:27**	**3:30**	**3:37**	**3:50**	**3:52**
—	**—**	**—**	**—**	**3:45**	**3:53**	**4:06**	**4:08**
3:16	**3:32**	**3:46**	**3:57**	**4:00**	**4:08**	**4:21**	**4:23**
—	**—**	**—**	**—**	**4:15**	**4:23**	**4:36**	**4:38**
3:46	**4:02**	**4:16**	**4:27**	**4:30**	**4:38**	**4:51**	**4:53**
—	**—**	**—**	**—**	**4:45**	**4:53**	**5:06**	**5:08**
4:16	**4:32**	**4:46**	**4:57**	**5:00**	**5:08**	**5:21**	**5:23**
—	**—**	**—**	**—**	**5:15**	**5:23**	**5:36**	**5:38**
4:46	**5:02**	**5:16**	**5:27**	**5:30**	**5:38**	**5:51**	**5:53**
—	**—**	**—**	**—**	**5:45**	**5:53**	**6:05**	**6:07**
5:16	**5:32**	**5:46**	**5:57**	**6:00**	**6:08**	**6:20**	**6:22**
—	**—**	**—**	**—**	**6:15**	**6:23**	**6:35**	**6:37**
5:50	**6:05**	**6:17**	**6:27**	**6:30**	**6:37**	**6:49**	**6:51**
6:20	**6:35**	**6:47**	**6:57**	**7:00**	**7:07**	**7:19**	**7:21**
6:55	**7:08**	**7:18**	**7:27**	**7:30**	**7:37**	**7:49**	**7:51**
7:25	**7:38**	**7:48**	**7:57**	**8:00**	**8:07**	**8:19**	**8:21**
7:55	**8:08**	**8:18**	**8:27**	**8:30**	**8:37**	**8:49**	**8:51**
8:32	**8:45**	**8:54**	**9:01**	**9:06**	**9:13**	**9:25**	**9:27**
9:04	**9:16**	**9:24**	**9:31**	**9:38**	**9:44**	**9:55**	**9:57**
9:34	**9:46**	**9:54**	**10:01**	**10:08**	**10:14**	**10:25**	**10:27**
10:04	**10:16**	**10:24**	**10:31**	**10:38**	**10:44**	**10:55**	**10:57**
10:34	**10:46**	**10:54**	**11:01**	**11:08**	**11:14**	**11:25**	**11:27**
—	**—**	**—**	**—**	**11:40**	**11:46**	**11:57**	**11:59**

LIMITED STOP ZONE / *ZONA DE PARADAS LIMITADAS*

Route 120

Saturday* / *sábado**

Downtown ➡ Hillcrest ➡ Fashion Valley ➡ Kearny Mesa

Ⓐ 4th Ave. & G St. DEPART	Ⓑ 5th Ave. & Broadway	Ⓒ 5th Ave. & University Ave.	Ⓓ Fashion Valley Transit Center ARRIVE	Ⓓ Fashion Valley Transit Center DEPART	Ⓔ Comstock St. & Linda Vista Rd.	Ⓕ Sharp Hospital (Health Center & Frost)	Ⓖ Kearny Mesa Transit Center ARRIVE
5:39a	5:41a	5:52a	6:00a	6:04a	6:11a	6:19a	6:29a
6:09	6:11	6:22	6:30	6:34	6:41	6:49	6:59
6:39	6:41	6:52	7:00	7:04	7:11	7:19	7:29
7:09	7:11	7:22	7:30	7:34	7:41	7:49	7:59
7:39	7:41	7:52	8:00	8:04	8:11	8:19	8:29
8:09	8:11	8:22	8:30	8:38	8:45	8:53	9:03
8:39	8:41	8:52	9:00	9:08	9:15	9:24	9:35
9:09	9:11	9:22	9:30	9:38	9:45	9:54	10:05
9:39	9:41	9:52	10:00	10:08	10:15	10:24	10:35
10:07	10:10	10:21	10:30	10:38	10:46	10:55	11:07
10:37	10:40	10:51	11:00	11:08	11:16	11:25	11:37
11:07	11:10	11:22	11:32	11:38	11:46	11:55	**12:08p**
11:37	11:40	11:52	**12:02p**	**12:08p**	**12:16p**	**12:25p**	**12:38**
12:07p	**12:10p**	**12:22p**	**12:32**	**12:38**	**12:46**	**12:55**	**1:08**
12:37	**12:40**	**12:52**	**1:02**	**1:08**	**1:16**	**1:25**	**1:38**
1:07	**1:10**	**1:22**	**1:32**	**1:38**	**1:46**	**1:55**	**2:08**
1:37	**1:40**	**1:52**	**2:02**	**2:08**	**2:16**	**2:25**	**2:38**
2:07	**2:10**	**2:22**	**2:32**	**2:38**	**2:46**	**2:55**	**3:08**
2:37	**2:40**	**2:52**	**3:02**	**3:08**	**3:16**	**3:25**	**3:38**
3:07	**3:10**	**3:22**	**3:32**	**3:38**	**3:46**	**3:55**	**4:08**
3:37	**3:40**	**3:52**	**4:02**	**4:08**	**4:16**	**4:25**	**4:38**
4:07	**4:10**	**4:22**	**4:32**	**4:38**	**4:46**	**4:55**	**5:08**
4:37	**4:40**	**4:52**	**5:02**	**5:08**	**5:16**	**5:25**	**5:38**
5:07	**5:10**	**5:22**	**5:32**	**5:38**	**5:46**	**5:55**	**6:08**
5:37	**5:40**	**5:51**	**6:00**	**6:08**	**6:16**	**6:24**	**6:36**
6:07	**6:10**	**6:21**	**6:30**	**6:38**	**6:46**	**6:54**	**7:06**
6:37	**6:40**	**6:51**	**7:00**	**7:08**	**7:16**	**7:24**	**7:36**
7:07	**7:10**	**7:21**	**7:30**	**7:38**	**7:46**	**7:54**	**8:06**
7:38	**7:40**	**7:51**	**8:00**	**8:06**	**8:13**	**8:20**	**8:30**
8:08	**8:10**	**8:21**	**8:30**	**8:36**	**8:43**	**8:50**	**9:00**
8:37	**8:39**	**8:50**	**8:59**	**9:06**	**9:13**	**9:20**	**9:30**
9:37	**9:39**	**9:50**	**9:59**	**10:06**	**10:13**	**10:20**	**10:30**

LIMITED STOP ZONE / *ZONA DE PARADAS LIMITADAS*

Kearny Mesa ➡ Fashion Valley ➡ Hillcrest ➡ Downtown

Ⓖ Kearny Mesa Transit Center DEPART	Ⓕ Sharp Hospital (Health Center & Frost)	Ⓔ Comstock St. & Linda Vista Rd.	Ⓓ Fashion Valley Transit Center ARRIVE	Ⓓ Fashion Valley Transit Center DEPART	Ⓒ University Ave. & 5th Ave.	Ⓑ 4th Ave. & Broadway	Ⓐ 4th Ave. & G St. ARRIVE
—	5:46a	5:54a	6:01a	6:08a	6:14a	6:25a	6:27a
6:05a	6:16	6:24	6:31	6:38	6:44	6:55	6:57
6:35	6:46	6:54	7:01	7:08	7:14	7:25	7:27
7:05	7:16	7:24	7:31	7:38	7:44	7:55	7:57
7:35	7:46	7:54	8:01	8:08	8:14	8:25	8:27
8:05	8:16	8:24	8:31	8:38	8:44	8:55	8:57
8:35	8:46	8:54	9:01	9:08	9:14	9:25	9:27
9:01	9:13	9:22	9:30	9:37	9:44	9:56	9:58
9:31	9:43	9:52	10:00	10:07	10:14	10:26	10:28
10:00	10:12	10:22	10:30	10:36	10:44	10:56	10:58
10:30	10:42	10:52	11:00	11:06	11:14	11:26	11:28
11:00	11:12	11:22	11:30	11:36	11:44	11:56	11:58
11:28	11:41	11:51	**12:00p**	**12:05p**	**12:13p**	**12:26p**	**12:28p**
11:58	**12:11p**	**12:21p**	**12:30**	**12:35**	**12:43**	**12:56**	**12:58**
12:28p	**12:41**	**12:51**	**1:00**	**1:05**	**1:13**	**1:26**	**1:28**
12:58	**1:11**	**1:21**	**1:30**	**1:35**	**1:43**	**1:56**	**1:58**
1:28	**1:41**	**1:51**	**2:00**	**2:05**	**2:13**	**2:26**	**2:28**
1:58	**2:11**	**2:21**	**2:30**	**2:35**	**2:43**	**2:56**	**2:58**
2:28	**2:41**	**2:51**	**3:00**	**3:05**	**3:13**	**3:26**	**3:28**
2:58	**3:11**	**3:21**	**3:30**	**3:35**	**3:43**	**3:56**	**3:58**
3:28	**3:41**	**3:51**	**4:00**	**4:05**	**4:13**	**4:26**	**4:28**
3:58	**4:11**	**4:21**	**4:30**	**4:35**	**4:43**	**4:56**	**4:58**
4:28	**4:41**	**4:51**	**5:00**	**5:05**	**5:13**	**5:26**	**5:28**
4:58	**5:11**	**5:21**	**5:30**	**5:35**	**5:43**	**5:56**	**5:58**
5:28	**5:41**	**5:51**	**6:00**	**6:08**	**6:15**	**6:27**	**6:29**
6:01	**6:13**	**6:22**	**6:30**	**6:38**	**6:45**	**6:57**	**6:59**
6:31	**6:43**	**6:52**	**7:00**	**7:08**	**7:15**	**7:27**	**7:29**
7:01	**7:13**	**7:22**	**7:30**	**7:38**	**7:45**	**7:57**	**7:59**
7:34	**7:45**	**7:53**	**8:00**	**8:08**	**8:14**	**8:25**	**8:27**
8:04	**8:15**	**8:23**	**8:30**	**8:38**	**8:44**	**8:55**	**8:57**
8:35	**8:46**	**8:54**	**9:01**	**9:08**	**9:14**	**9:25**	**9:27**
9:05	**9:16**	**9:24**	**9:31**	**9:38**	**9:44**	**9:55**	**9:57**
9:35	**9:46**	**9:54**	**10:01**	**10:08**	**10:14**	**10:25**	**10:27**

LIMITED STOP ZONE / *ZONA DE PARADAS LIMITADAS*

*A Saturday or Sunday schedule will be operated on most holidays and observed holidays, including New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas. For holiday service details, visit www.sdmts.com or call 511.

**Se operará con horario de sábado o domingo durante la mayoría de los días festivos y los días de asueto a guardar. Los días festivos incluyen Año Nuevo, Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias y Navidad. Para detalles sobre el servicio en días festivos, visite www.sdmts.com o llame al 511.*

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*	
Day Pass (Regional) / *Pase diario (Regional)*	$5.00
One-Way Fare / *Tarifa de una direccíon*	$2.50
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.25*
Children 5 & under / *Niños de 5 años o menores*	FREE / *GRATIS**

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menores)*	$36.00*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

Valid for unlimited travel for one person on Trolley, most MTS buses, NCTD Breeze and SPRINTER. Valid for a discount on COASTER fares; not valid on Premium Express, Rural, or special service buses, or ADA paratransit.

Válidos para viajes ilimitados de una sola persona para: el Trolley, la mayoría de los autobuses de MTS, y los servicios del NCTD de BREEZE y SPRINTER. Válidos para acceder a descuentos en el COASTER, pero no para las rutas Premium Express ni rurales, los servicios especiales ni los servicios para discapacitadas de ADA.

* I.D. required for discount fare or pass.
** Se requiere identificación para tarifas o pases de descuento.*

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	(619) 557-4555
SafeWatch	(619) 557-4500
Lost & Found *Objetos extraviados*	(877) 841-3278
The Transit Store	(619) 234-1060 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	www.sdmts.com

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Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective SEPTEMBER 5, 2010

870

El Cajon Transit Center – Kearny Mesa Express via Santee Trolley Station / SR-52

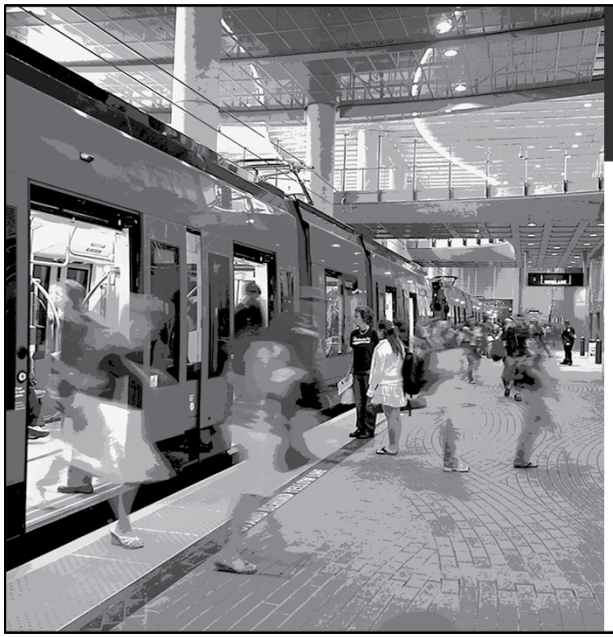
AWARDED OUTSTANDING PUBLIC TRANSIT SYSTEM MTS

DESTINATIONS

- Balboa Avenue
- County Operations Center
- Kearny Mesa Transit Center
- Ruffin Road
- Santee Transit Center

TROLLEY CONNECTIONS
Santee
El Cajon

MTS Metropolitan Transit System



The Transit Store

Your full-service store for

• Tickets and Passes • Brochures • Maps and Timetables
• Compass Cards • Souvenirs • Transit IDs and more!

102 Broadway (at First Avenue)
Downtown San Diego
Monday - Friday, 9:00 a.m. to 5:00 p.m.

MTS www.sdmts.com

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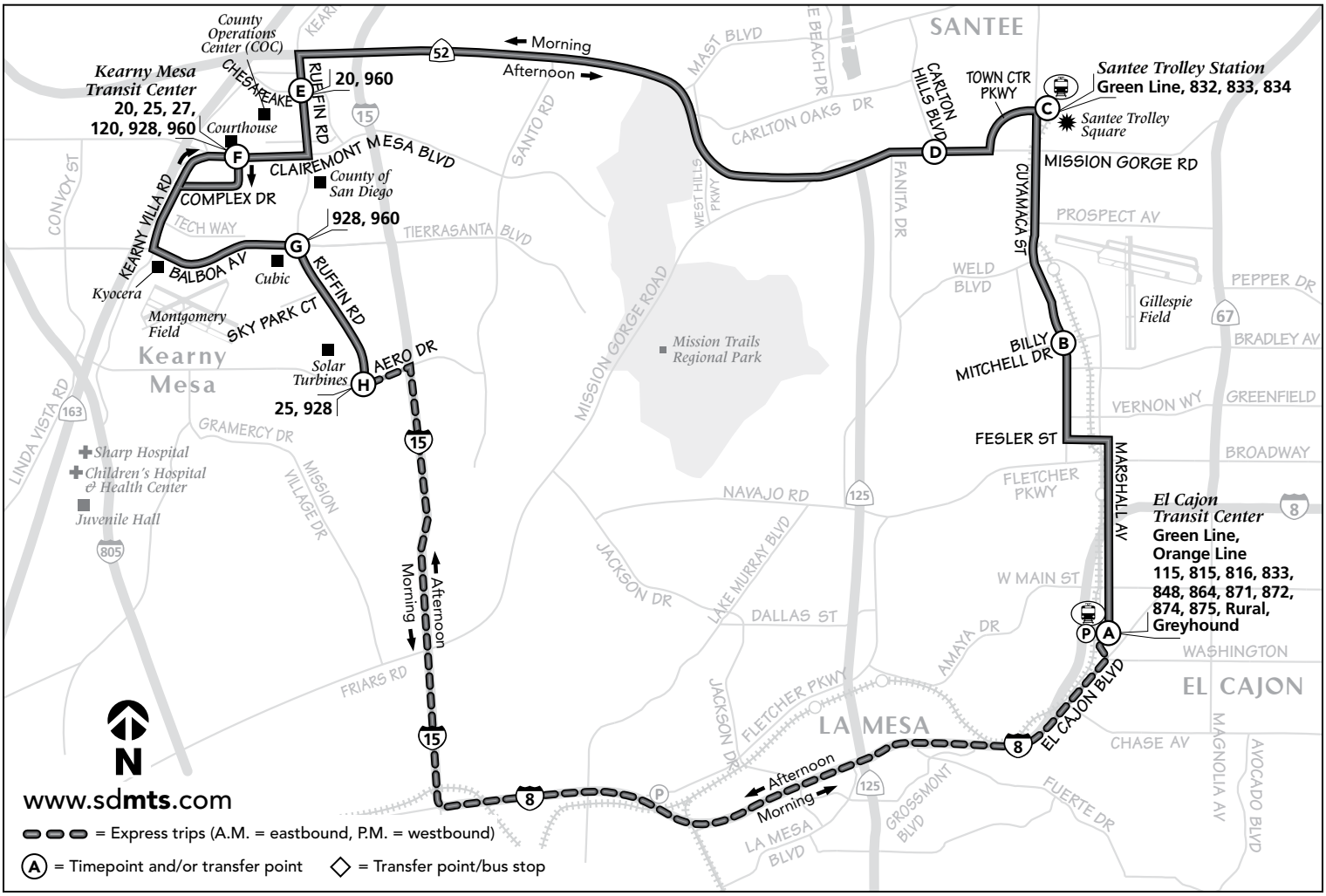
Los horarios y información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.



Alternative formats are available upon request. Please call:
Formato alternativo disponible al preguntar. Favor de llamar: **(619) 231-1466**

Route 870 – Westbound

Monday through Friday / *lunes a viernes*

El Cajon Transit Center ➡ Santee ➡ Kearny Mesa

(A) El Cajon Transit Center **DEPART**	(B) Cuyamaca St. & Billy Mitchell Dr.	(C) Santee Trolley Station	(D) Mission Gorge Rd. & Carlton Hills Blvd.	(E) Ruffin Rd. & Chesapeake Dr. (St. Lottery Bldg.)	(F)* Kearny Mesa Transit Center	(G) Balboa Ave. & Ruffin Rd. (Cubic @ 9333 Balboa)	(H) Ruffin Rd. & Aero Dr. **ARRIVE**
6:00a	6:06a	6:13a	6:16a	6:38a	6:42a	6:47a	6:51a §
7:15	7:21	7:28	7:31	7:53	7:57	8:02	8:06 §
4:55p	→	→	→	→	→	→	**5:15p**

Shaded times are approximate. Bus may depart up to 5 minutes earlier than time shown. / *Los tiempos sombreados son aproximados. El autobús podría salir hasta 5 minutos antes de la hora mostrada.*

Route 870 – Eastbound

Monday through Friday / *lunes a viernes*

Kearny Mesa ➡ Santee ➡ El Cajon Transit Center

(H) Ruffin Rd. & Aero Dr. **DEPART**	(G) Balboa Ave. & Ruffin Rd. (Foodmaker)	(F)** Kearny Mesa Transit Center	(E) Ruffin Rd. & Chesapeake Dr. (Advisor Pub.)	(D) Mission Gorge Rd. & Carlton Hills Blvd.	(C) Santee Trolley Station	(B) Cuyamaca St. & Billy Mitchell Dr.	(A) El Cajon Transit Center **ARRIVE**
6:51a	→	→	→	→	→	→	7:09a
8:06	→	→	→	→	→	→	8:24
4:00p	**4:04p**	**4:10p**	**4:14p**	**4:31p**	**4:35p**	**4:41p**	**4:47p #**
5:15	**5:19**	**5:25**	**5:29**	**5:46**	**5:50**	**5:56**	**6:02**

Shaded times are approximate. Bus may depart up to 5 minutes earlier than time shown. / *Los tiempos sombreados son aproximados. El autobús podría salir hasta 5 minutos antes de la hora mostrada.*

***** = Bus stop located on Complex Drive next to Bank of America / *Parada de autobús situada en Complex Drive unidad junto a Bank of America*
****** = Bus stop located on Clairemont Mesa Blvd. in front of Spice House Restaurant / *Parada de autobús situada en Clairemont Mesa Blvd. delante de Spice House Restaurant*
§ = Continues as Express trip (no stops) to El Cajon Transit Center / *Continua sin paradas a El Cajon Transit Center*
# = Continues as Express trip (no stops) to Kearny Mesa / *Continua sin paradas a Kearny Mesa*

Route 870 does not operate on weekends or on the observation of the following holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas / *La ruta 870 no ofrece servicio durante el fin de semana ó durante los siguientes días festivos: Año Nuevo, el día después Año Nuevo (2 de enero), Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias, y Navidad*

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*	
Day Pass (Regional) / *Pase diario (Regional)*	$5.00
One-Way Fare / *Tarifa de una direccíon*	$2.25
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.10*
Children 5 & under / *Niños de 5 años o menos*	FREE / *GRATIS**

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menos)*	$36.00*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

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* I.D. required for discount fare or pass.
** Se requiere identificación para tarifas o pases de descuento.*

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	(619) 656-2300
SafeWatch	(619) 557-4500
Lost & Found *Objetos extraviados*	(619) 427-6438 or/ó (800) 409-3310
The Transit Store	(619) 234-1060 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	www.sdmts.com

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Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JANUARY 30, 2011

25 — Fashion Valley – Kearny Mesa
via Linda Vista / Stonecrest

928 — Fashion Valley – Kearny Mesa
via Serra Mesa / Stonecrest

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION AWARDED OUTSTANDING PUBLIC TRANSIT SYSTEM MTS

DESTINATIONS
- Children's Hospital (25)
- Fashion Valley Mall
- Hazard Center (928)
- Kearny Mesa Courthouse
- Linda Vista Park & Rec Center (25)
- Serra High School (25)
- Sharp Hospital (25)
- Stonecrest Plaza

TROLLEY CONNECTION
Fashion Valley

MTS Metropolitan Transit System

Alternative formats available upon request. Please call: (619) 557-4555 / *Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555*

Route 25

Monday through Friday only / *lunes a viernes solamente*

Fashion Valley ➡ Linda Vista ➡ Tierrasanta ➡ Kearny Mesa

Ⓐ Fashion Valley Transit Center **DEPART**	Ⓑ Comstock St. & Linda Vista Rd.	Ⓒ Sharp Hospital (Health Center & Frost)	Ⓔ Stonecrest Plaza	Ⓕ Tierrasanta Blvd. & Santo Rd.	Ⓖ Clairemont Mesa Blvd. & Santo Rd.	Ⓘ Kearny Mesa Transit Center **ARRIVE**
—	—	—	6:38a	6:44a	6:48a	6:56a
7:09a	7:16a	7:27a	7:38	7:44	7:48	7:56
8:09	8:16	8:27	8:38	8:44	8:48	8:56
9:07	9:14	9:25	9:36	9:42	9:46	9:54
10:07	10:14	10:25	10:36	10:42	10:46	10:54
11:07	11:14	11:25	11:36	11:42	11:46	11:54
12:07p	**12:14p**	**12:25p**	**12:36p**	**12:42p**	**12:46p**	**12:54p**
1:07	**1:14**	**1:26**	**1:39**	**1:46**	**1:50**	**1:58**
2:10	**2:17**	**2:29**	**2:42**	**2:49**	**2:53**	**3:01**
3:10	**3:17**	**3:29**	**3:42**	**3:49**	**3:53**	**4:01**
4:13	**4:20**	**4:32**	**4:45**	**4:52**	**4:56**	**5:04**
5:16	**5:23**	**5:35**	**5:48**	**5:55**	**5:59**	**6:07**
6:18	**6:25**	**6:37**	**6:50**	**6:57**	**7:01**	**7:09**

Kearny Mesa ➡ Tierrasanta ➡ Linda Vista ➡ Fashion Valley

Ⓘ Kearny Mesa Transit Center• **DEPART**	Ⓖ Clairemont Mesa Blvd. & Santo Rd.	Ⓕ Santo Rd. & Tierrasanta Blvd.	Ⓔ Stonecrest Plaza	Ⓒ Sharp Hospital (Health Center & Frost)	Ⓑ Comstock St. & Linda Vista Rd.	Ⓐ Fashion Valley Transit Center **ARRIVE**
—	—	—	6:25a	6:40a	6:51a	6:58a
7:07a	7:13a	7:18a	7:27	7:42	7:53	8:00
8:07	8:13	8:18	8:27	8:42	8:53	9:00
9:07	9:13	9:18	9:27	9:42	9:53	10:00
10:07	10:13	10:18	10:27	10:42	10:53	11:00
11:07	11:13	11:18	11:27	11:42	11:53	**12:00p**
12:07p	**12:13p**	**12:18p**	**12:27p**	**12:42p**	**12:53p**	**1:00**
1:07	**1:13**	**1:18**	**1:27**	**1:43**	**1:55**	**2:03**
2:07	**2:13**	**2:18**	**2:27**	**2:43**	**2:55**	**3:03**
3:10	**3:16**	**3:21**	**3:30**	**3:46**	**3:58**	**4:06**
4:10	**4:16**	**4:21**	**4:30**	**4:46**	**4:58**	**5:06**
5:12	**5:18**	**5:23**	**5:32**	**5:48**	**6:00**	**6:08**
6:17	**6:23**	**6:28**	**6:36**	**6:50**	**7:01**	**7:08**

• = Board bus on Clairemont Mesa Blvd. in front of Spice House Restaurant / *Encuentra el autobús en Clairemont Mesa Blvd. en frente del restaurante Spice House*

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Route 928 — Monday through Friday / *lunes a viernes*

Fashion Valley ➡ Kearny Mesa

(A) Fashion Valley T.C. **DEPART**	(D) Murray Ridge & Sandrock	(E) Stone-crest Plaza	(H) Ruffin Rd. & Balboa Ave.	(I) Kearny Mesa T.C. **ARRIVE**
5:24a	5:37a	5:47a	5:53a	6:00a
5:54	6:07	6:17	6:23	6:30
6:24	6:37	6:47	6:53	7:00
6:54	7:07	7:17	7:23	7:30
7:24	7:37	7:47	7:53	8:00
7:54	8:07	8:17	8:23	8:30
8:24	8:37	8:47	8:53	9:00
8:54	9:07	9:17	9:23	9:30
9:24	9:37	9:47	9:53	10:00
9:54	10:07	10:17	10:23	10:30
10:24	10:37	10:47	10:53	11:00
10:54	11:07	11:17	11:23	11:30
11:24	11:37	11:48	11:55	**12:02p**
11:54	**12:08p**	**12:19p**	**12:26p**	**12:34**
12:24p	**12:38**	**12:49**	**12:56**	**1:04**
12:54	**1:08**	**1:19**	**1:26**	**1:34**
1:24	**1:38**	**1:49**	**1:56**	**2:04**
1:54	**2:08**	**2:19**	**2:26**	**2:34**
2:24	**2:38**	**2:49**	**2:56**	**3:04**
2:54	**3:08**	**3:19**	**3:26**	**3:34**
3:24	**3:39**	**3:50**	**3:59**	**4:07**
3:54	**4:09**	**4:20**	**4:29**	**4:37**
4:24	**4:39**	**4:50**	**4:59**	**5:07**
4:54	**5:09**	**5:20**	**5:29**	**5:37**
5:24	**5:39**	**5:50**	**5:59**	**6:07**
5:54	**6:09**	**6:20**	**6:27**	**6:35**
6:28	**6:43**	**6:54**	**7:01**	**7:09**
7:36	**7:50**	**8:00**	**8:06**	**8:13**
8:39	**8:52**	**9:02**	—	—
9:39	**9:52**	**10:02**	—	—

Kearny Mesa ➡ Fashion Valley

(I) Kearny Mesa T.C.• **DEPART**	(H) Ruffin Rd. & Balboa Ave.	(E) Stone-crest Plaza	(D) Murray Ridge & Sandrock	(A) Fashion Valley T.C. **ARRIVE**
—	—	4:50a	4:58a	5:13a
—	—	5:20	5:28	5:43
—	—	5:50	5:58	6:13
6:11a	6:15a	6:20	6:28	6:43
6:37	6:42	6:48	6:57	7:13
7:07	7:12	7:18	7:27	7:43
7:37	7:42	7:48	7:57	8:13
8:07	8:12	8:18	8:27	8:43
8:37	8:42	8:48	8:57	9:13
9:07	9:12	9:18	9:27	9:43
9:37	9:42	9:48	9:57	10:13
10:07	10:12	10:18	10:27	10:43
10:37	10:42	10:48	10:57	11:13
11:05	11:10	11:17	11:27	11:43
11:35	11:40	11:47	11:57	**12:13p**
12:03p	**12:08p**	**12:15p**	**12:27p**	**12:43**
12:33	**12:38**	**12:45**	**12:57**	**1:13**
1:03	**1:08**	**1:15**	**1:27**	**1:43**
1:33	**1:38**	**1:45**	**1:57**	**2:13**
2:03	**2:08**	**2:15**	**2:27**	**2:43**
2:33	**2:38**	**2:45**	**2:57**	**3:13**
3:05	**3:10**	**3:17**	**3:27**	**3:43**
3:35	**3:40**	**3:47**	**3:57**	**4:13**
4:05	**4:10**	**4:17**	**4:27**	**4:43**
4:35	**4:40**	**4:47**	**4:57**	**5:13**
5:05	**5:10**	**5:17**	**5:27**	**5:43**
5:35	**5:40**	**5:47**	**5:57**	**6:13**
6:05	**6:10**	**6:17**	**6:27**	**6:43**
6:40	**6:45**	**6:51**	**7:00**	**7:15**
7:51	**7:56**	**8:02**	**8:11**	**8:26**
—	—	**9:03**	**9:11**	**9:26**

Route 928 — Saturday* / *sábado**

Fashion Valley ➡ Kearny Mesa

(A) Fashion Valley T.C. **DEPART**	(D) Murray Ridge & Sandrock	(E) Stone-crest Plaza	(H) Ruffin Rd. & Balboa Ave.	(I) Kearny Mesa T.C. **ARRIVE**
7:08a	7:20a	7:30a	—	—
8:08	8:20	8:30	—	—
9:08	9:20	9:30	—	—
10:08	10:20	10:30	—	—
11:08	11:20	11:30	—	—
12:08p	**12:22p**	**12:32p**	—	—
1:08	**1:22**	**1:32**	—	—
2:08	**2:22**	**2:32**	—	—
3:08	**3:22**	**3:32**	—	—
4:08	**4:22**	**4:32**	—	—
5:08	**5:22**	**5:32**	—	—
6:08	**6:22**	**6:32**	—	—
7:09	**7:22**	**7:32**	—	—
8:09	**8:22**	**8:32**	—	—
9:09	**9:21**	**9:31**	—	—

Kearny Mesa ➡ Fashion Valley

(I) Kearny Mesa T.C. **DEPART**	(H) Ruffin Rd. & Balboa Ave.	(E) Stone-crest Plaza	(D) Murray Ridge & Sandrock	(A) Fashion Valley T.C. **ARRIVE**
—	—	6:34a	6:43a	6:58a
—	—	7:34	7:43	7:58
—	—	8:34	8:43	8:58
—	—	9:34	9:43	9:58
—	—	10:33	10:43	10:59
—	—	11:33	11:43	11:59
—	—	**12:33p**	**12:43p**	**12:59p**
—	—	**1:33**	**1:43**	**1:59**
—	—	**2:33**	**2:43**	**2:59**
—	—	**3:33**	**3:43**	**3:59**
—	—	**4:33**	**4:43**	**4:59**
—	—	**5:33**	**5:43**	**5:59**

Route 928 — Sunday* / *domingo**

Fashion Valley ➡ Kearny Mesa

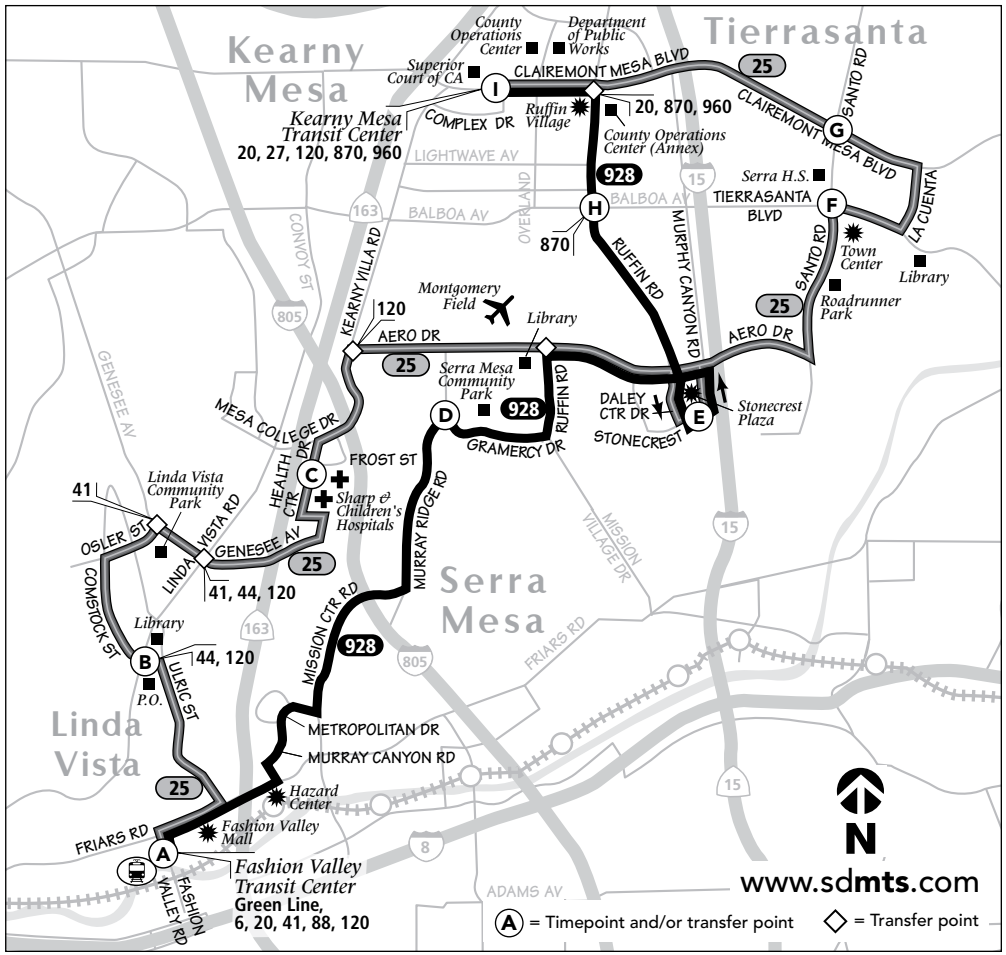
(A) Fashion Valley T.C. **DEPART**	(D) Murray Ridge & Sandrock	(E) Stone-crest Plaza	(H) Ruffin Rd. & Balboa Ave.	(I) Kearny Mesa Transit Ctr. **ARRIVE**
9:08a	9:20a	9:30a	—	—
10:08	10:20	10:30	—	—
11:08	11:20	11:30	—	—
12:08p	**12:22p**	**12:32p**	—	—
1:08	**1:22**	**1:32**	—	—
2:08	**2:22**	**2:32**	—	—
3:08	**3:22**	**3:32**	—	—
4:08	**4:22**	**4:32**	—	—
5:08	**5:22**	**5:32**	—	—
6:08	**6:22**	**6:32**	—	—

Kearny Mesa ➡ Fashion Valley

(I) Kearny Mesa Transit Ctr.• **DEPART**	(H) Ruffin Rd. & Balboa Ave.	(E) Stone-crest Plaza	(D) Murray Ridge & Sandrock	(A) Fashion Valley T.C. **ARRIVE**
—	—	8:34a	8:43a	8:58a
—	—	9:34	9:43	9:58
—	—	10:33	10:43	10:59
—	—	11:33	11:43	11:59
—	—	**12:33p**	**12:43p**	**12:59p**
—	—	**1:33**	**1:43**	**1:59**
—	—	**2:33**	**2:43**	**2:59**
—	—	**3:33**	**3:43**	**3:59**
—	—	**4:33**	**4:43**	**4:59**
—	—	**5:33**	**5:43**	**5:59**

• = Board bus on Clairemont Mesa Blvd. in front of Spice House Restaurant
Encuentra el autobús en Clairemont Mesa Blvd. en frente del restaurante Spice House

*A Saturday or Sunday schedule will be operated on most holidays and observed holidays, including New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas. For holiday service details, visit www.sdmts.com or call 511. / *Se operará con horario de sábado o domingo durante la mayoría de los días festivos y los feriados observados. Los días festivos incluyen Año Nuevo, Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias y Navidad. Para detalles sobre el servicio en días festivos, visite www.sdmts.com o llame al 511.*



CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*	
Day Pass (Regional) / *Pase diario (Regional)*	$5.00
One-Way Fare / *Tarifa de una direccíon*	$2.50
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.25*
Children 5 & under / *Niños de 5 años o menores*	FREE / *GRATIS**

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menores)*	$36.00*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

Valid for unlimited travel for one person on Trolley, most MTS buses, NCTD Breeze and SPRINTER. Valid for a discount on COASTER fares; not valid on Premium Express, Rural, or special service buses, or ADA paratransit.

Válidos para viajes ilimitados de una sola persona para: el Trolley, la mayoría de los autobuses de MTS, y los servicios del NCTD de BREEZE y SPRINTER. Válidos para acceder a descuentos en el COASTER, pero no para las rutas Premium Express ni rurales, los servicios especiales ni los servicios para discapacitadas de ADA.

* I.D. required for discount fare or pass.
* *Se requiere identificación para tarifas o pases de descuento.*

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	(619) 557-4555
SafeWatch	(619) 557-4500
Lost & Found *Objetos extraviados*	(619) 427-6438 or/ó (800) 409-3310
The Transit Store	(619) 234-1060 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	www.sdmts.com

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit www.sdmts.com.

Para obtener más información sobre el uso de los servicios de MTS, recoga un 'Rider's Guide' en un autobús o en 'The Transit Store,' o visita a www.sdmts.com.

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective FEBRUARY 28, 2010

960

Euclid Trolley – UTC

via I-15 Mid City / Kearny Mesa

AWARDED OUTSTANDING PUBLIC TRANSIT SYSTEM MTS

DESTINATIONS

- The Boulevard Transit Plaza
- City Heights Transit Plaza
- Kearny Mesa Courthouse
- Kearny Mesa Transit Center
- Market Creek Plaza

TROLLEY CONNECTION
Euclid Ave.

MTS Metropolitan Transit System

Alternative formats are available upon request. Please call: / *Formato alternativo disponible al preguntar. Favor de llamar:* (619) 231-1466

Route 960 – North

Monday through Friday* / *lunes a viernes**

Euclid Trolley ➡ City Heights ➡ Kearny Mesa ➡ University City

(A) Euclid Ave. Trolley Station DEPART	(B) City Heights Transit Plaza	(C) The Boulevard Transit Plaza	(D) Balboa Ave. & Ruffin Rd.	(E) Kearny Mesa Transit Center (Clairemont Mesa Bl.) ARRIVE	DEPART	(F) Ruffin Rd. & Chesapeake Dr.	(G) UTC Transit Center ARRIVE
5:09a	5:16a	5:17a	5:24a	5:31a	—	—	—
5:23	5:30	5:31	5:38	5:45	5:47a	5:50a	6:06a
5:38	5:47	5:48	5:57	6:07	6:10	6:13	6:33
5:53	6:02	6:03	6:12	6:22	—	—	—
6:08	6:17	6:18	6:27	6:37	6:40	6:43	7:03
6:28	6:37	6:38	6:47	6:57	7:00	7:03	7:27
6:48	6:57	6:58	7:07	7:17	7:20	7:23	7:45
7:08	7:17	7:18	7:27	7:37	—	—	—

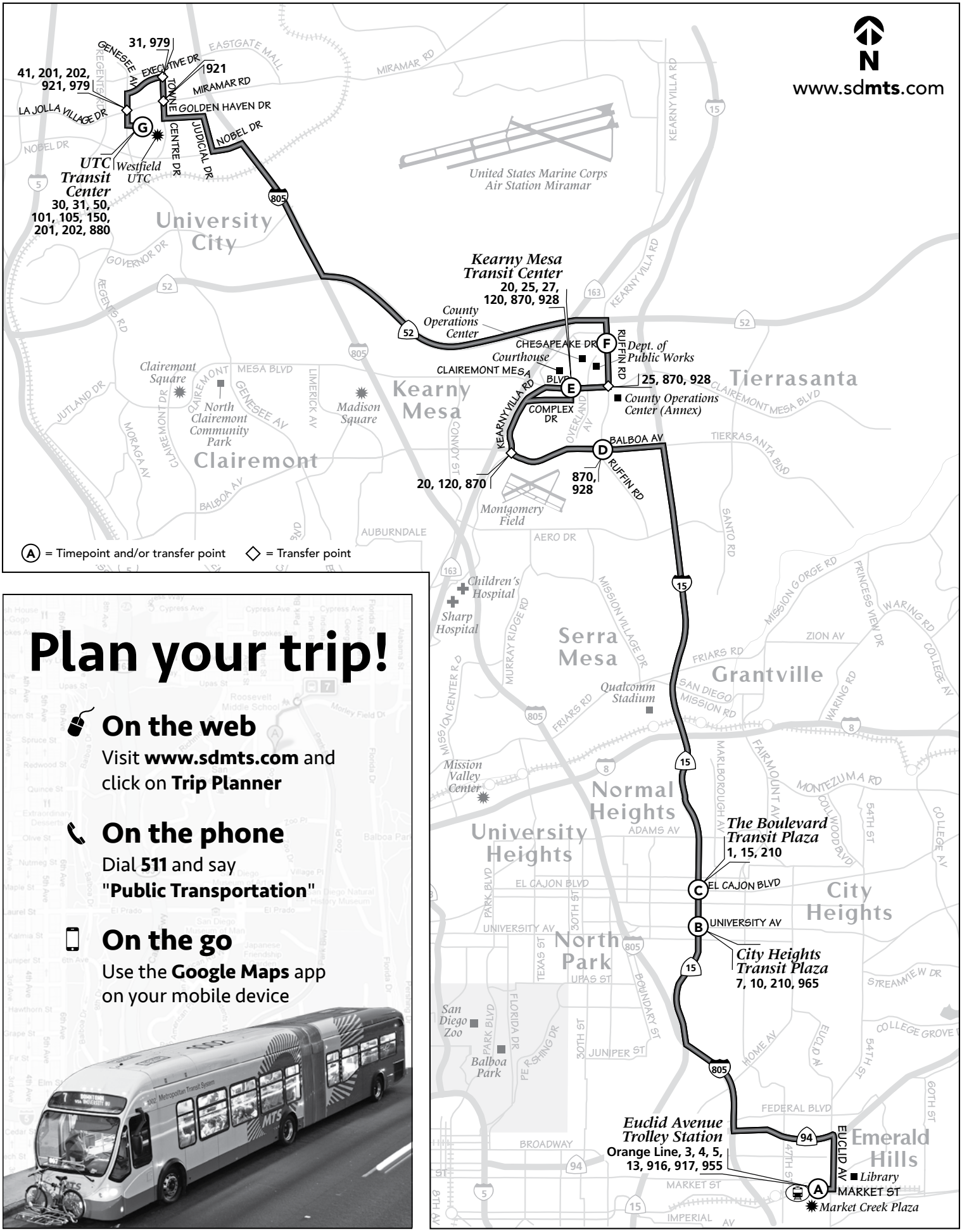
Route 960 – South

Monday through Friday* / *lunes a viernes**

University City ➡ Kearny Mesa ➡ City Heights ➡ Euclid Trolley

(G) UTC Transit Center DEPART	(F) Ruffin Rd. & Chesapeake Dr.	(E) Kearny Mesa Transit Center (Complex Dr.) ARRIVE	DEPART	(D) Balboa Ave. & Ruffin Rd.	(C) The Boulevard Transit Plaza	(B) City Heights Transit Plaza	(A) Euclid Ave. Trolley Station ARRIVE
3:20p	3:35p	3:42p	3:45p	3:52p	4:01p	4:03p	4:16p
3:50	4:05	4:12	4:15	4:22	4:31	4:33	4:46
4:20	4:38	4:46	4:46	4:53	5:02	5:04	5:20
4:50	5:08	5:16	5:16	5:23	5:32	5:34	5:50
5:20	5:38	5:46	5:46	5:53	6:02	6:04	6:20
5:50	6:05	6:12	6:15	6:22	6:30	6:32	6:47

*Route 960 does not operate on weekends or on the observation of the following holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, & Christmas
**La ruta 960 no ofrece servicio durante el fín de semana ó durante los siguientes días festivos: Año Nuevo, Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias, y Navidad*



Plan your trip!

On the web

Visit **www.sdmts.com** and click on **Trip Planner**

On the phone

Dial **511** and say **"Public Transportation"**

On the go

Use the **Google Maps** app on your mobile device

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses. / *Los horarios y información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.*

APPENDIX B

EXISTING DATA

B – 1

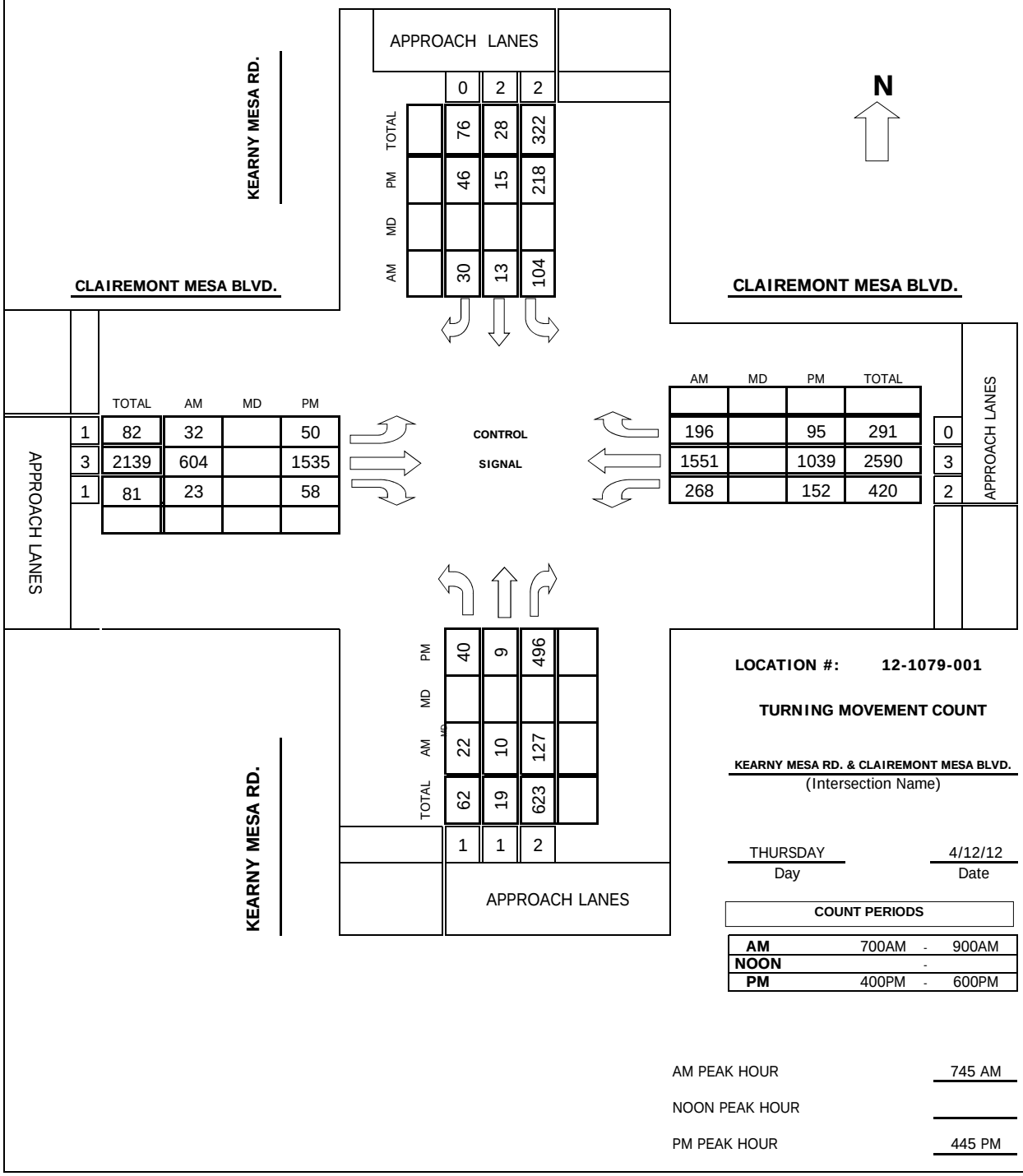
PEAK HOUR MANUAL COUNT SHEETS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-001

TMC SUMMARY OF KEARNY MESA RD. & CLAIREMONT MESA BLVD.



LOCATION #: 12-1079-001

TURNING MOVEMENT COUNT

KEARNY MESA RD. & CLAIREMONT MESA BLVD.
(Intersection Name)

THURSDAY — Day
4/12/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 745 AM

NOON PEAK HOUR:

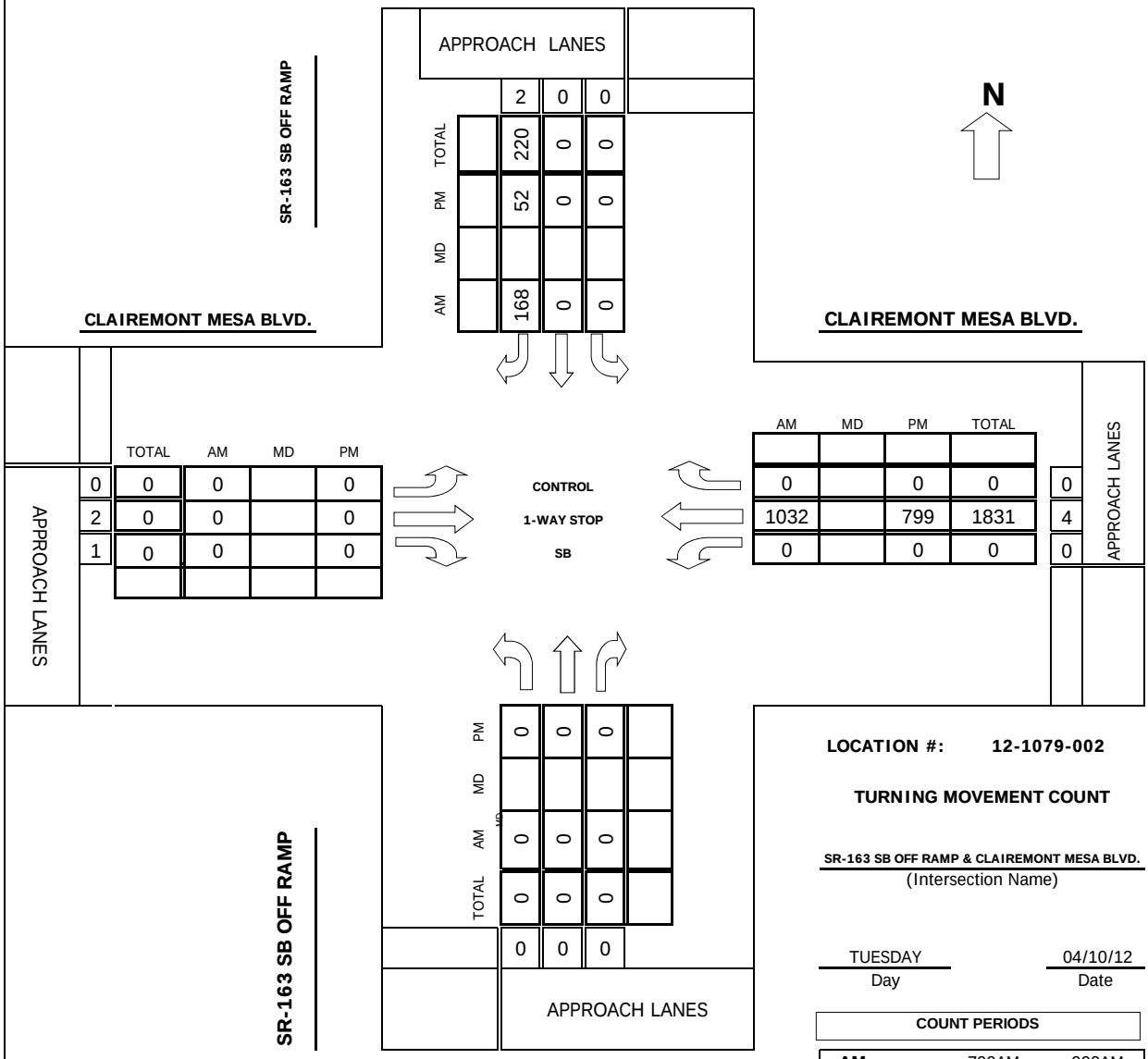
PM PEAK HOUR: 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-002

TMC SUMMARY OF SR-163 SB OFF RAMP & CLAIREMONT MESA BLVD.



LOCATION #: 12-1079-002

TURNING MOVEMENT COUNT

SR-163 SB OFF RAMP & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY	04/10/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	745 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-001

TMC SUMMARY OF SR-163 NB RAMPS & CLAIREMONT MESA BLVD.

SR-163 NB RAMPS

APPROACH LANES

	0	0	0
TOTAL	0	0	0
PM	0	0	0
MD			
AM	0	0	0

N

CLAIREMONT MESA BLVD.

CLAIREMONT MESA BLVD.

APPROACH LANES

	TOTAL	AM	MD	PM
0	0	0		0
3	2193	1314		879
1	1010	205		805

CONTROL SIGNAL

AM	MD	PM	TOTAL	
168		547	715	1
597		1333	1930	3
0		0	0	0

APPROACH LANES

PM	215	0	277	
MD				
AM	822	0	682	
TOTAL	1037	0	959	
	2	1	2	

APPROACH LANES

SR-163 NB RAMPS

LOCATION #: 12-1004-001

TURNING MOVEMENT COUNT

SR-163 NB RAMPS & CLAIREMONT MESA BLVD.
(Intersection Name)

WEDNESDAY	01/11/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-002

TMC SUMMARY OF KEARNY VILLA RD. & CLAIREMONT MESA BLVD.

KEARNY VILLA RD.

APPROACH LANES

	1	1	1
TOTAL	378	114	55
PM	251	71	33
MD			
AM	127	43	22

CLAIREMONT MESA BLVD.

N

CLAIREMONT MESA BLVD.

APPROACH LANES

	TOTAL	AM	MD	PM
2	329	156		173
3	1794	1059		735
1	972	758		214

CONTROL SIGNAL

	AM	MD	PM	TOTAL
1	9		6	15
3	589		1164	1753
1	51		91	142

APPROACH LANES

KEARNY VILLA RD.

PM	498	62	103
MD			
AM	189	51	86
TOTAL	687	113	189
	2	1	1

APPROACH LANES

LOCATION #: 12-1004-002

TURNING MOVEMENT COUNT

KEARNY VILLA RD. & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY — Day
01/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 745 AM

NOON PEAK HOUR:

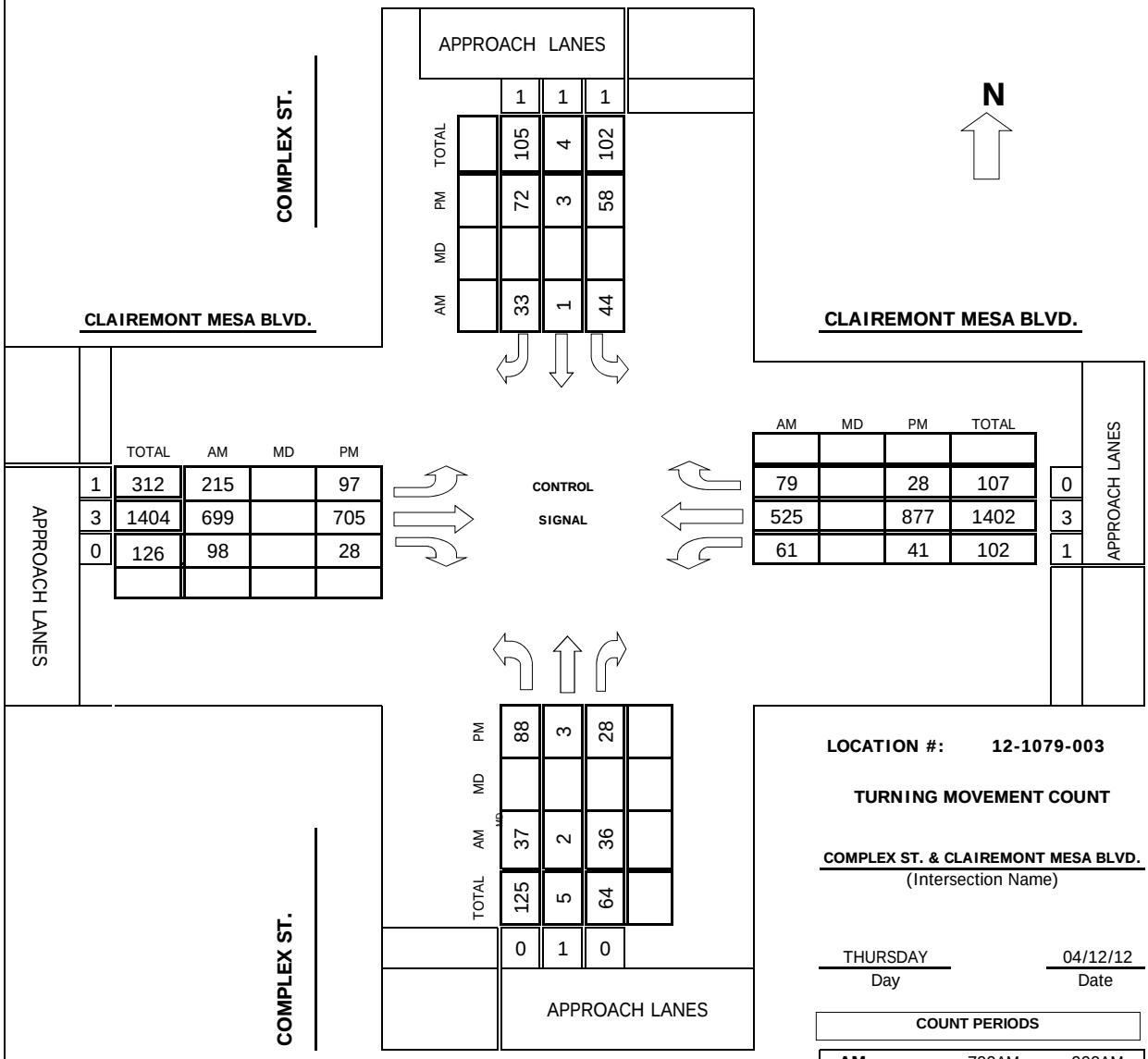
PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-003

TMC SUMMARY OF COMPLEX ST. & CLAIREMONT MESA BLVD.



LOCATION #: 12-1079-003

TURNING MOVEMENT COUNT

COMPLEX ST. & CLAIREMONT MESA BLVD.
(Intersection Name)

THURSDAY — Day
04/12/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 745 AM

NOON PEAK HOUR:

PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-003

TMC SUMMARY OF OVERLAND AVE. & CLAIREMONT MESA BLVD.

OVERLAND AVE.

APPROACH LANES

	0	1	1
TOTAL	168	36	81
PM	123	20	53
MD			
AM	45	16	28

N

CLAIREMONT MESA BLVD.

CLAIREMONT MESA BLVD.

APPROACH LANES

	TOTAL	AM	MD	PM
2	190	132		58
3	1448	653		795
0	115	69		46

CONTROL SIGNAL

	AM	MD	PM	TOTAL
1	39		23	62
3	544		739	1283
2	116		151	267

APPROACH LANES

OVERLAND AVE.

	1	2	0
PM	165	28	101
MD			
AM	101	43	38
TOTAL	266	71	139

APPROACH LANES

LOCATION #: 12-1004-003

TURNING MOVEMENT COUNT

OVERLAND AVE. & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY	01/10/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	800 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-004

TMC SUMMARY OF RUFFIN RD. & CLAIREMONT MESA BLVD.

RUFFIN RD.

CLAIREMONT MESA BLVD.

CLAIREMONT MESA BLVD.

RUFFIN RD.

N

APPROACH LANES

		1	2	2
TOTAL		281	795	544
PM		156	381	389
MD				
AM		125	414	155

APPROACH LANES

	TOTAL	AM	MD	PM
2	499	238		261
3	1065	291		774
0	252	135		117

CONTROL SIGNAL

	AM	MD	PM	TOTAL
0	188		44	232
3	553		398	951
2	452		227	679

APPROACH LANES

APPROACH LANES

	2	2	2
PM	228	501	191
MD			
AM	89	187	63
TOTAL	317	688	254

APPROACH LANES

LOCATION #: 12-1004-004

TURNING MOVEMENT COUNT

RUFFIN RD. & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY	01/10/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

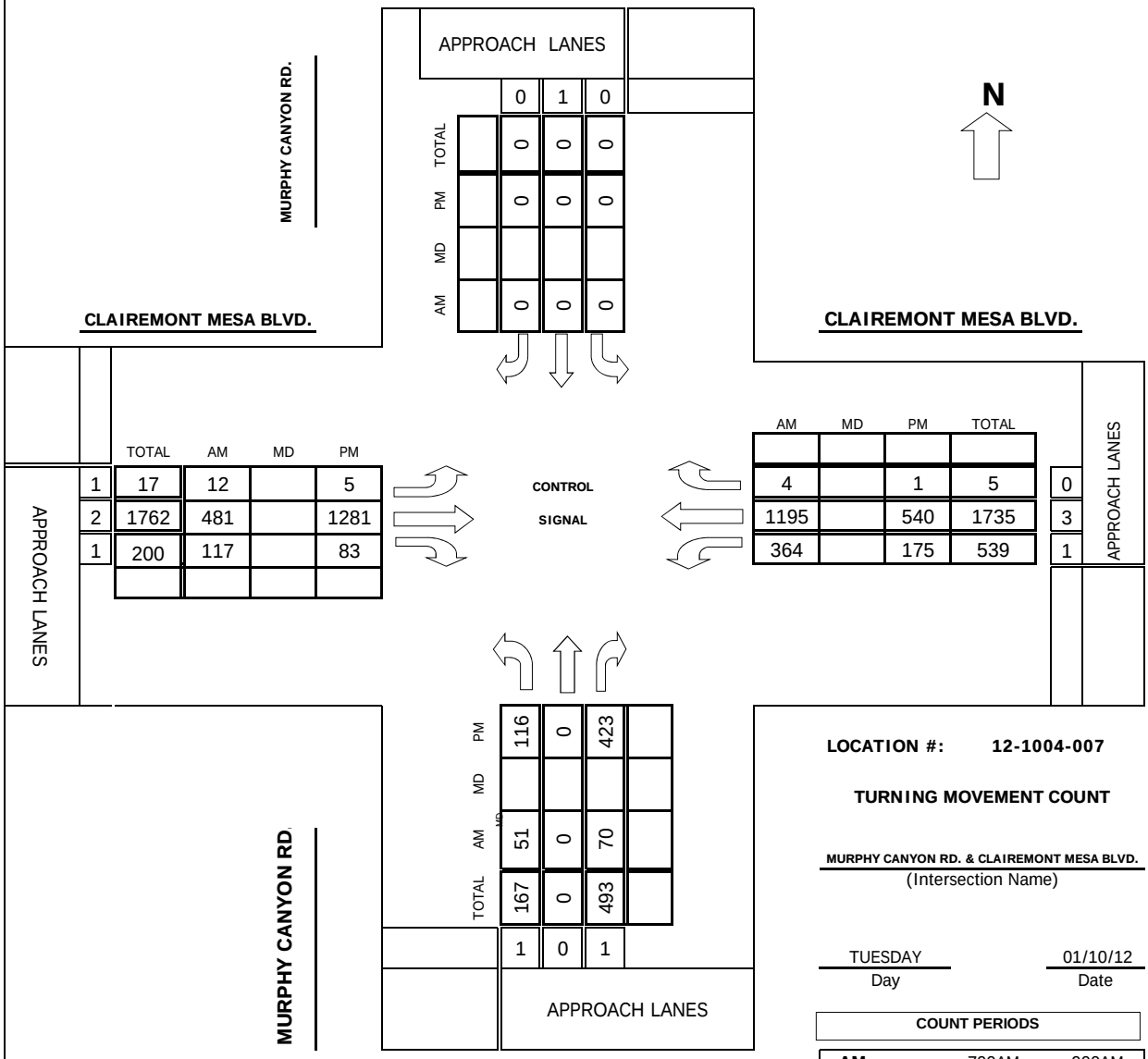
AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-007

TMC SUMMARY OF MURPHY CANYON RD. & CLAIREMONT MESA BLVD.



LOCATION #: 12-1004-007

TURNING MOVEMENT COUNT

MURPHY CANYON RD. & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY	01/10/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	800 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-008

TMC SUMMARY OF I-15 SB RAMPS & CLAIREMONT MESA BLVD.

I-15 SB RAMPS

APPROACH LANES

	1	0	1
TOTAL	860	8	876
PM	219	7	777
MD			
AM	641	1	99

N

CLAIREMONT MESA BLVD.

CLAIREMONT MESA BLVD.

APPROACH LANES

	TOTAL	AM	MD	PM
0	0	0		0
2	1362	258		1104
1	748	202		546

CONTROL SIGNAL

AM	MD	PM	TOTAL	
0		0	0	0
1055		585	1640	2
462		207	669	2

APPROACH LANES

I-15 SB RAMPS

PM	0	0	0
MD			
AM	0	0	0
TOTAL	0	0	0
	0	0	0

APPROACH LANES

LOCATION #: 12-1004-008

TURNING MOVEMENT COUNT

I-15 SB RAMPS & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY — Day
01/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 800 AM

NOON PEAK HOUR:

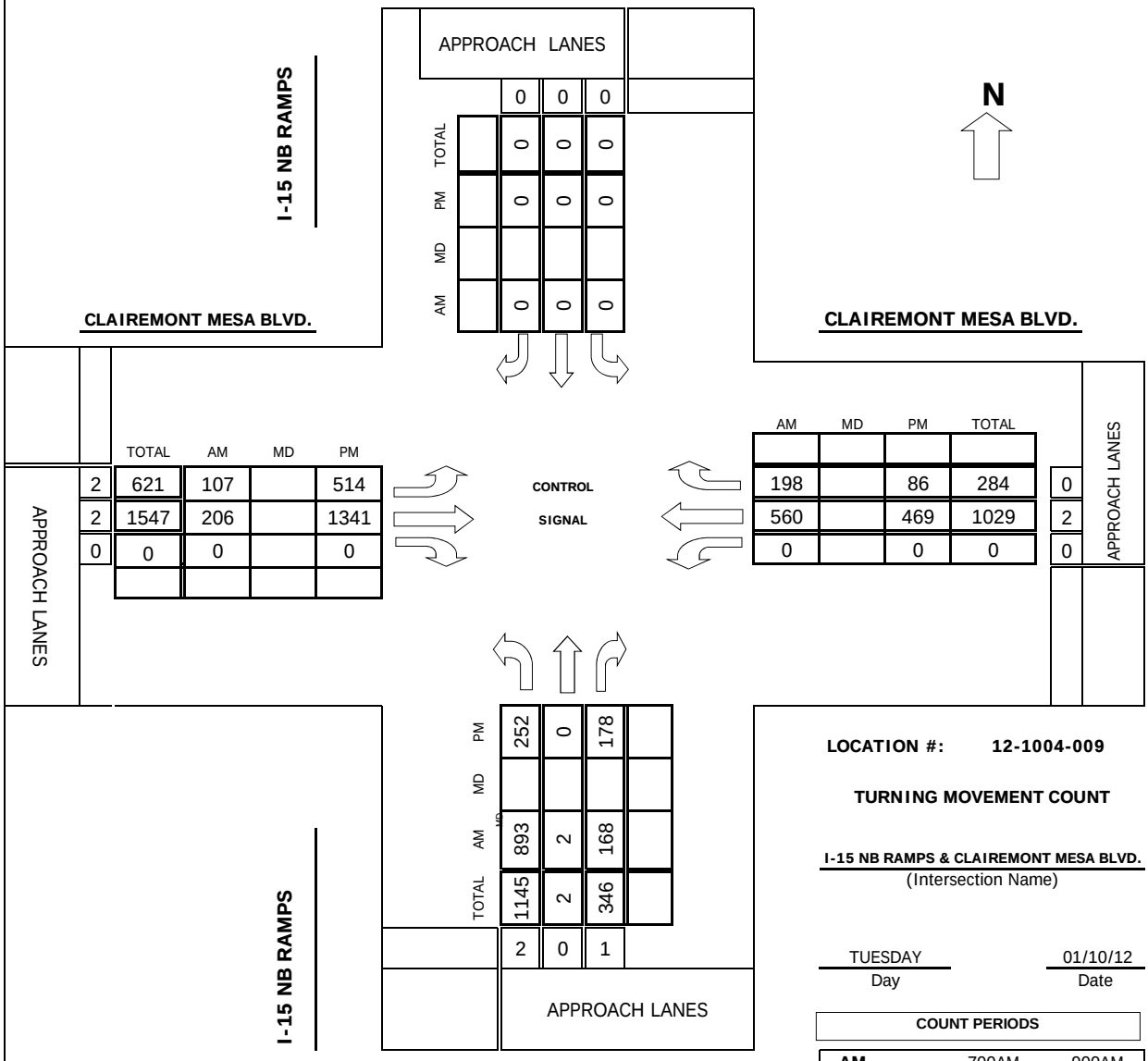
PM PEAK HOUR: 500 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-009

TMC SUMMARY OF I-15 NB RAMPS & CLAIREMONT MESA BLVD.



LOCATION #: 12-1004-009

TURNING MOVEMENT COUNT

I-15 NB RAMPS & CLAIREMONT MESA BLVD.
(Intersection Name)

TUESDAY	01/10/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

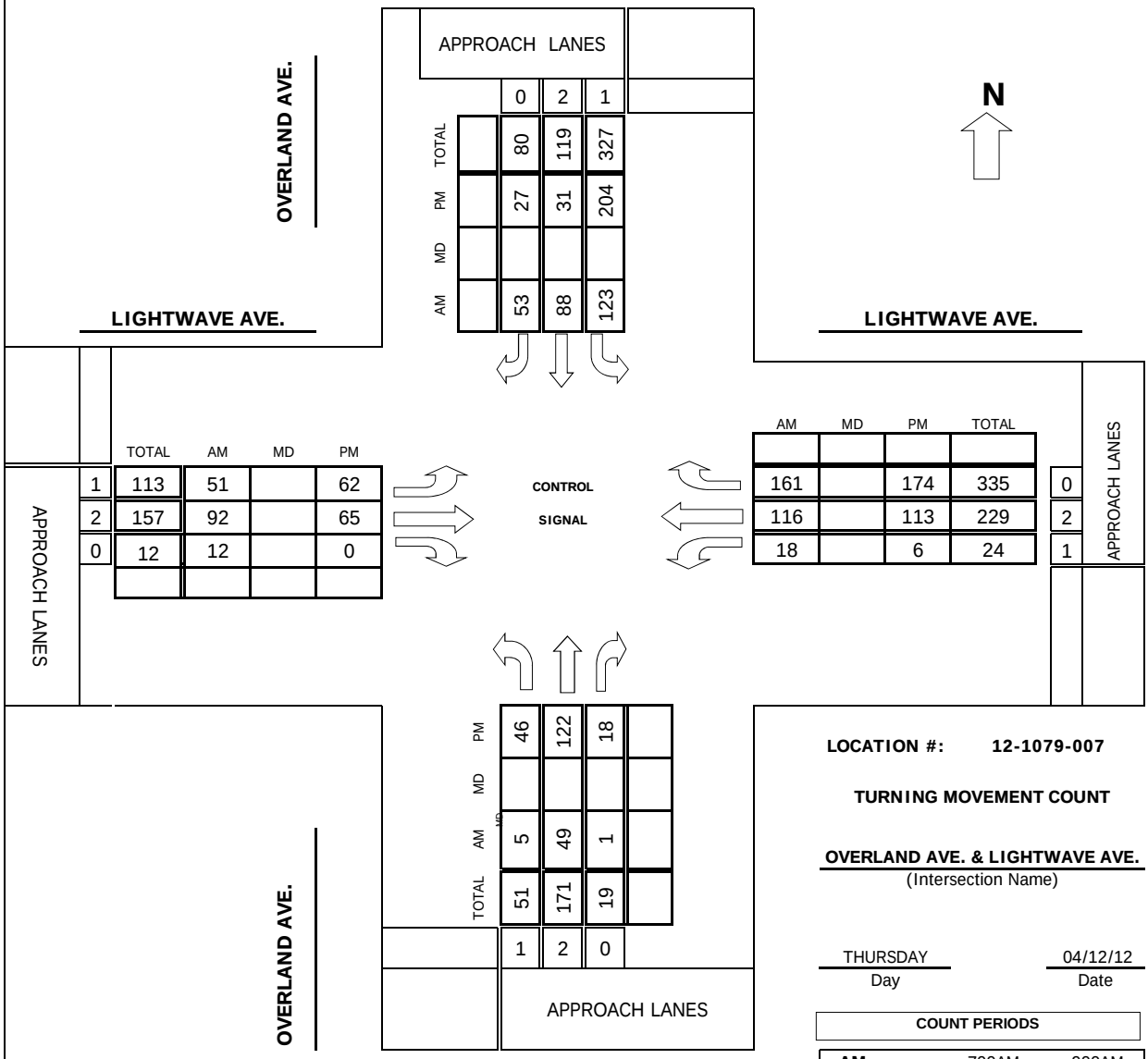
AM PEAK HOUR	715 AM
NOON PEAK HOUR	
PM PEAK HOUR	500 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-007

TMC SUMMARY OF OVERLAND AVE. & LIGHTWAVE AVE.



	0	2	1
TOTAL	80	119	327
PM	27	31	204
MD			
AM	53	88	123

	TOTAL	AM	MD	PM
1	113	51		62
2	157	92		65
0	12	12		0

AM	MD	PM	TOTAL	
161		174	335	0
116		113	229	2
18		6	24	1

	1	2	0
PM	46	122	18
MD			
AM	5	49	1
TOTAL	51	171	19

LOCATION #: 12-1079-007

TURNING MOVEMENT COUNT

OVERLAND AVE. & LIGHTWAVE AVE.
(Intersection Name)

THURSDAY — Day
04/12/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 730 AM

NOON PEAK HOUR:

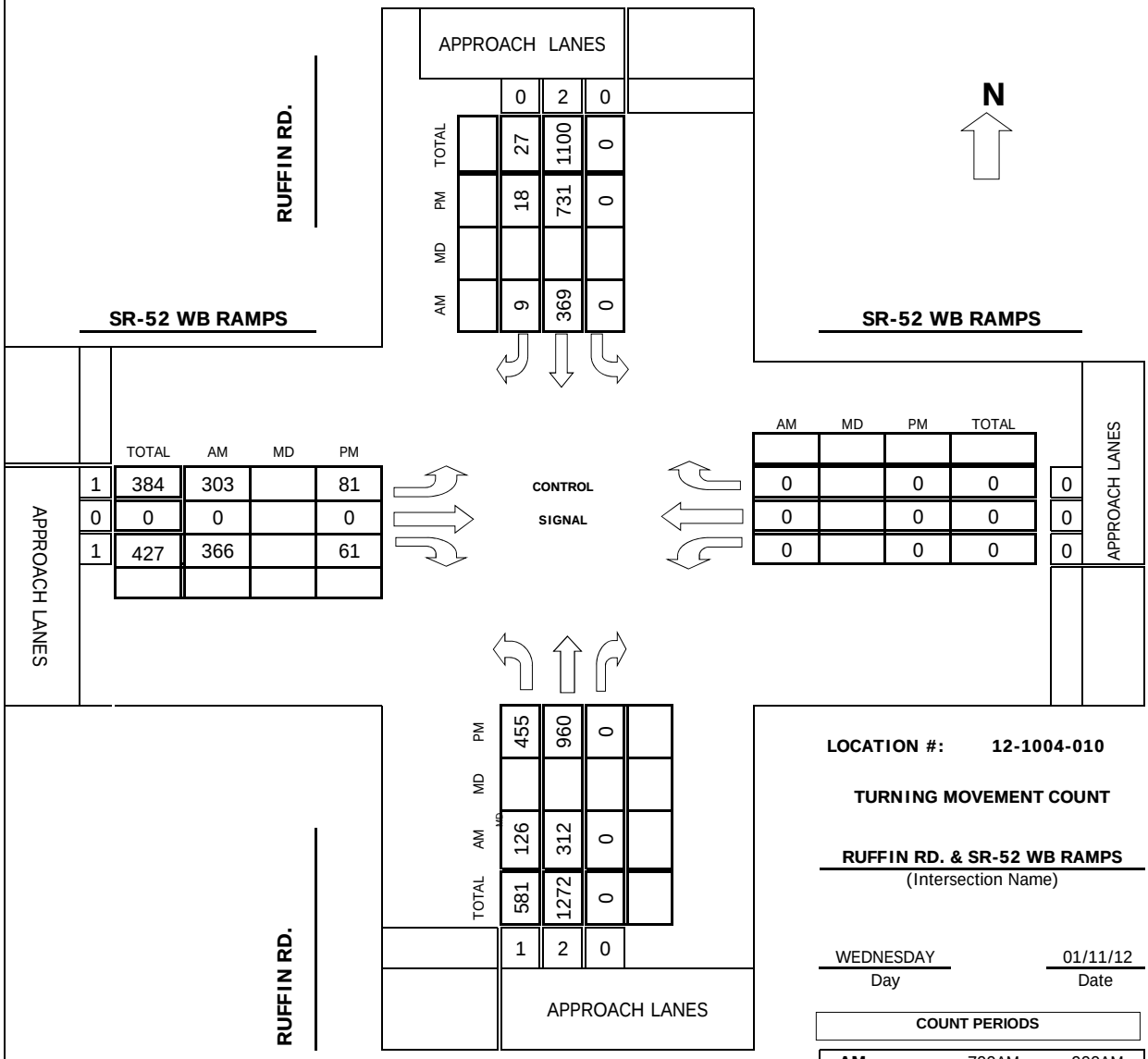
PM PEAK HOUR: 500 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-010

TMC SUMMARY OF RUFFIN RD. & SR-52 WB RAMPS



LOCATION #: 12-1004-010

TURNING MOVEMENT COUNT

RUFFIN RD. & SR-52 WB RAMPS
(Intersection Name)

WEDNESDAY — Day
01/11/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 700 AM

NOON PEAK HOUR:

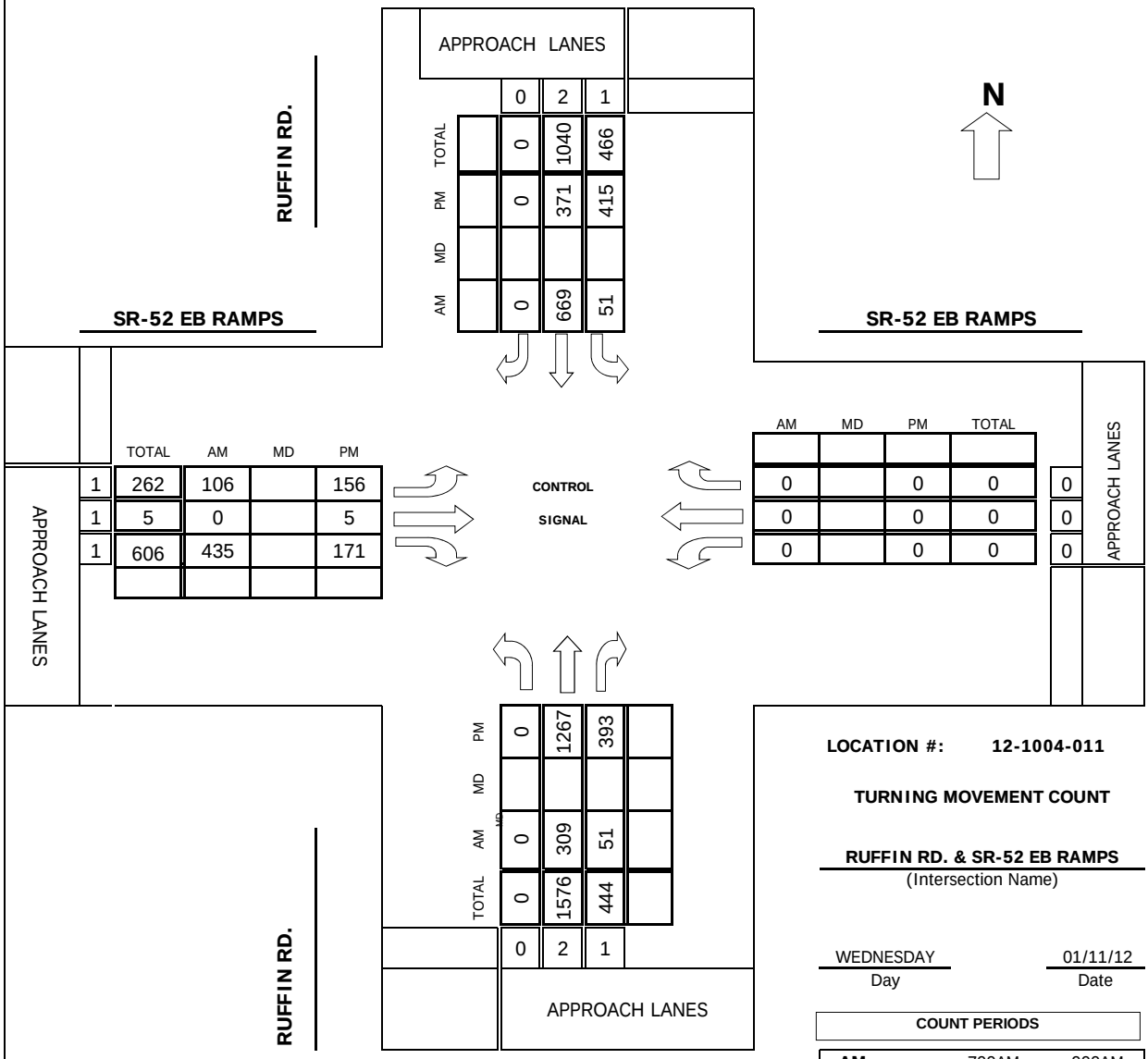
PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-011

TMC SUMMARY OF RUFFIN RD. & SR-52 EB RAMPS



		TOTAL	AM	MD	PM
		0	2		1
TOTAL		0	1040		466
PM		0	371		415
MD					
AM		0	669		51

	TOTAL	AM	MD	PM
1	262	106		156
1	5	0		5
1	606	435		171

AM	MD	PM	TOTAL	
0		0	0	0
0		0	0	0
0		0	0	0

PM	0	1267	393	
MD				
AM	0	309	51	
TOTAL	0	1576	444	
	0	2	1	

LOCATION #: 12-1004-011

TURNING MOVEMENT COUNT

RUFFIN RD. & SR-52 EB RAMPS
(Intersection Name)

WEDNESDAY	01/11/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

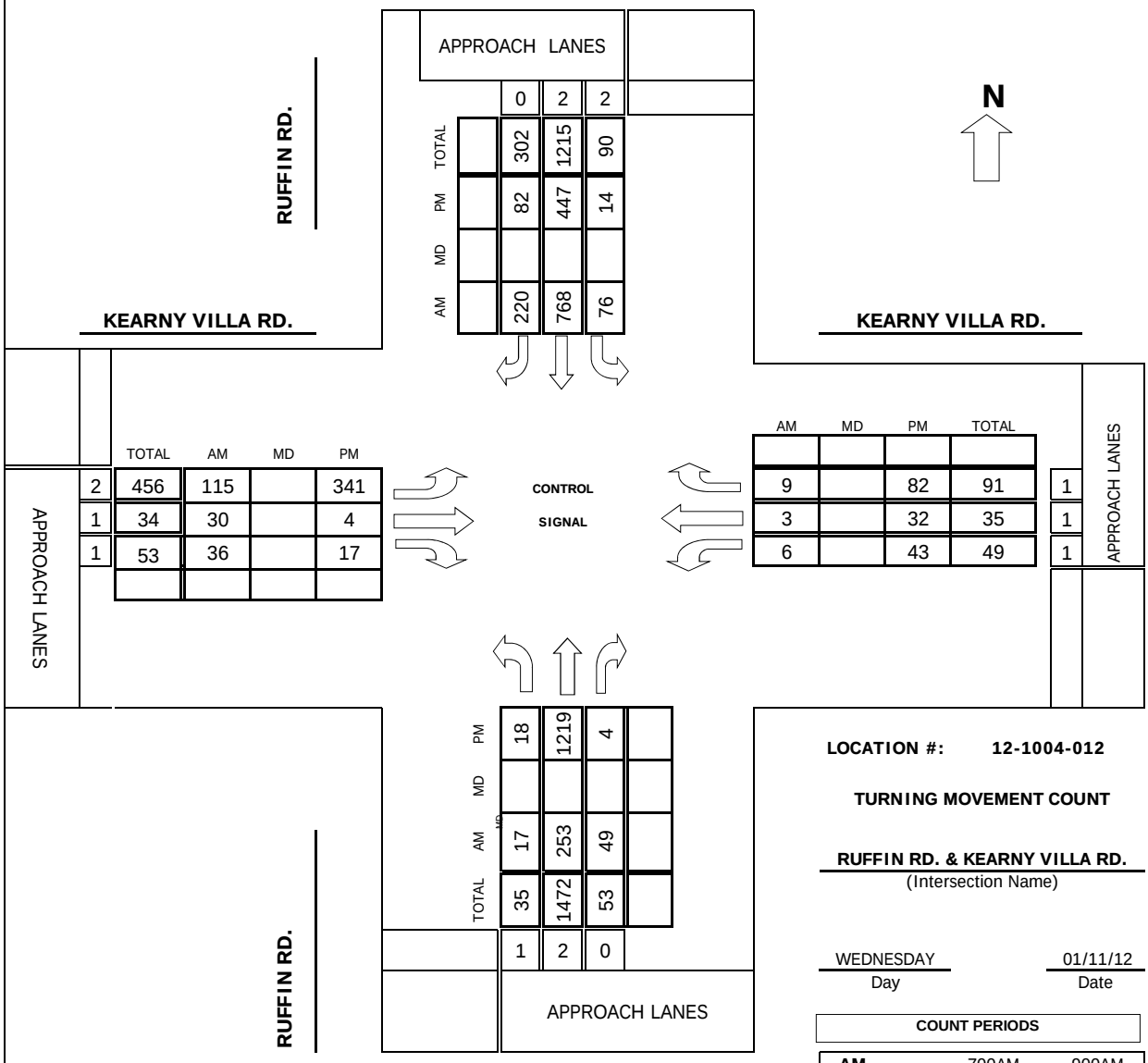
AM PEAK HOUR	700 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-012

TMC SUMMARY OF RUFFIN RD. & KEARNY VILLA RD.



LOCATION #: 12-1004-012

TURNING MOVEMENT COUNT

RUFFIN RD. & KEARNY VILLA RD.
(Intersection Name)

WEDNESDAY — Day
01/11/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 700 AM

NOON PEAK HOUR:

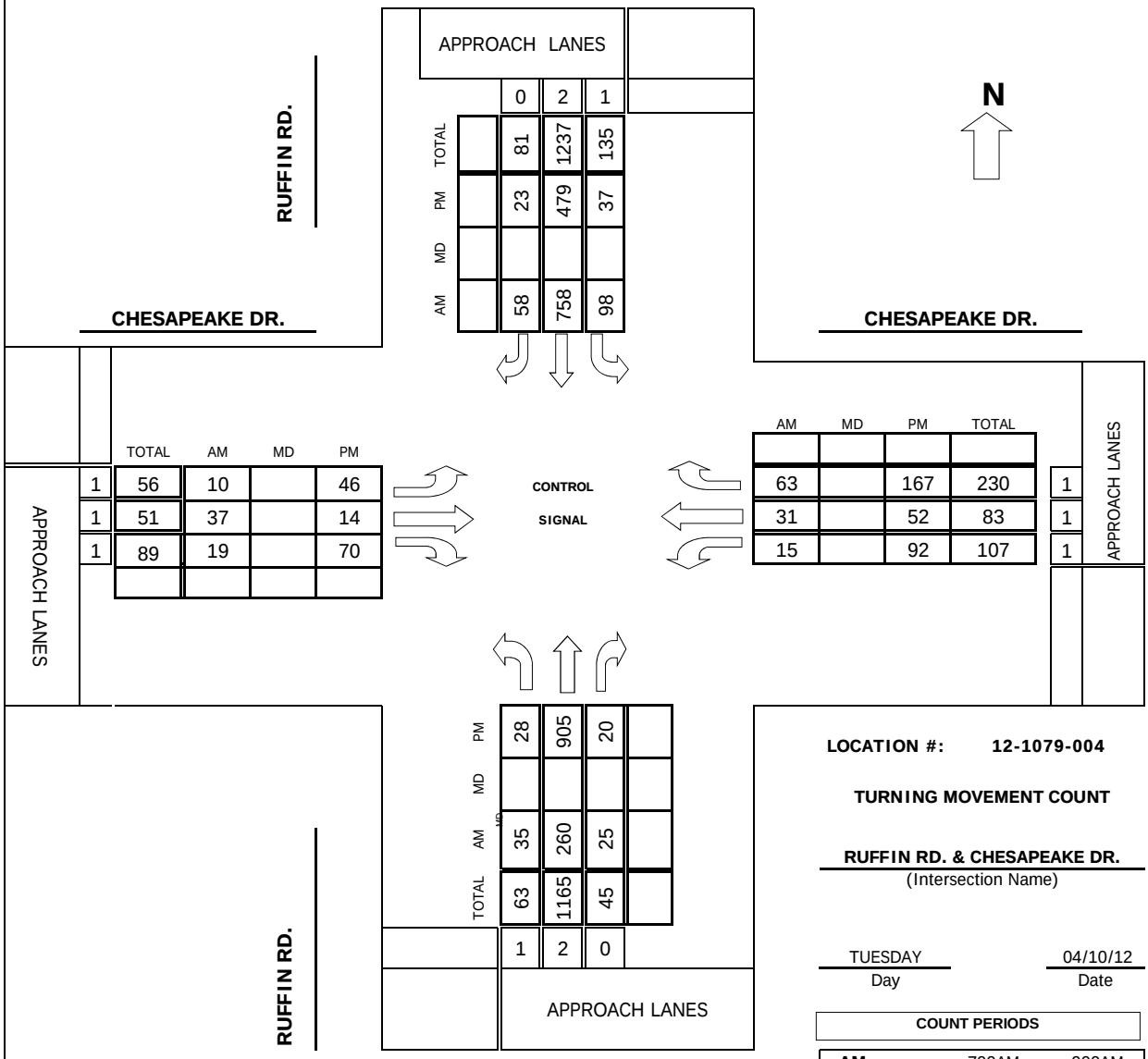
PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-004

TMC SUMMARY OF RUFFIN RD. & CHESAPEAKE DR.



LOCATION #: 12-1079-004

TURNING MOVEMENT COUNT

RUFFIN RD. & CHESAPEAKE DR.
(Intersection Name)

TUESDAY — Day
04/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 715 AM

NOON PEAK HOUR:

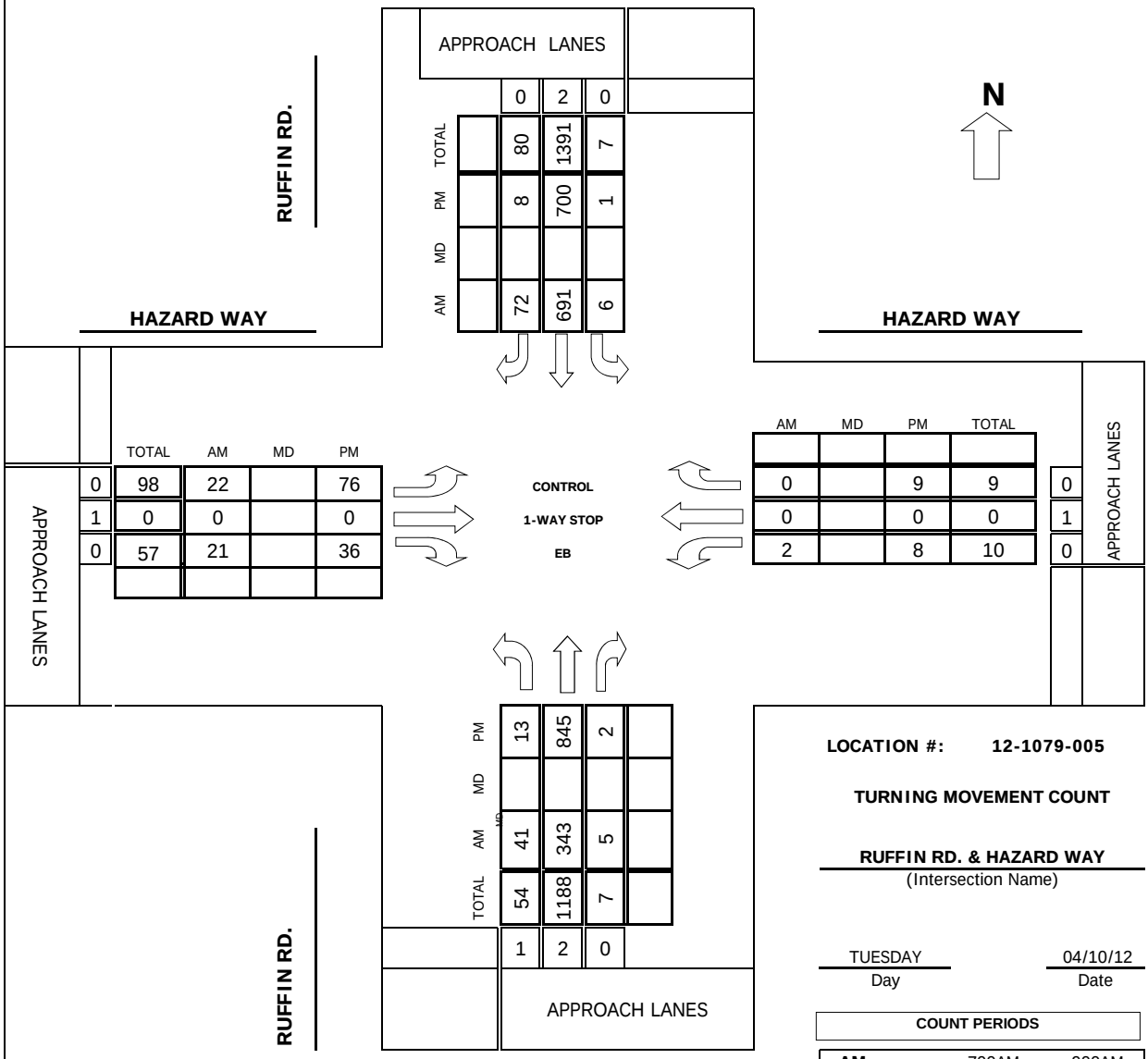
PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-005

TMC SUMMARY OF RUFFIN RD. & HAZARD WAY



LOCATION #: 12-1079-005

TURNING MOVEMENT COUNT

RUFFIN RD. & HAZARD WAY
(Intersection Name)

TUESDAY	04/10/12
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

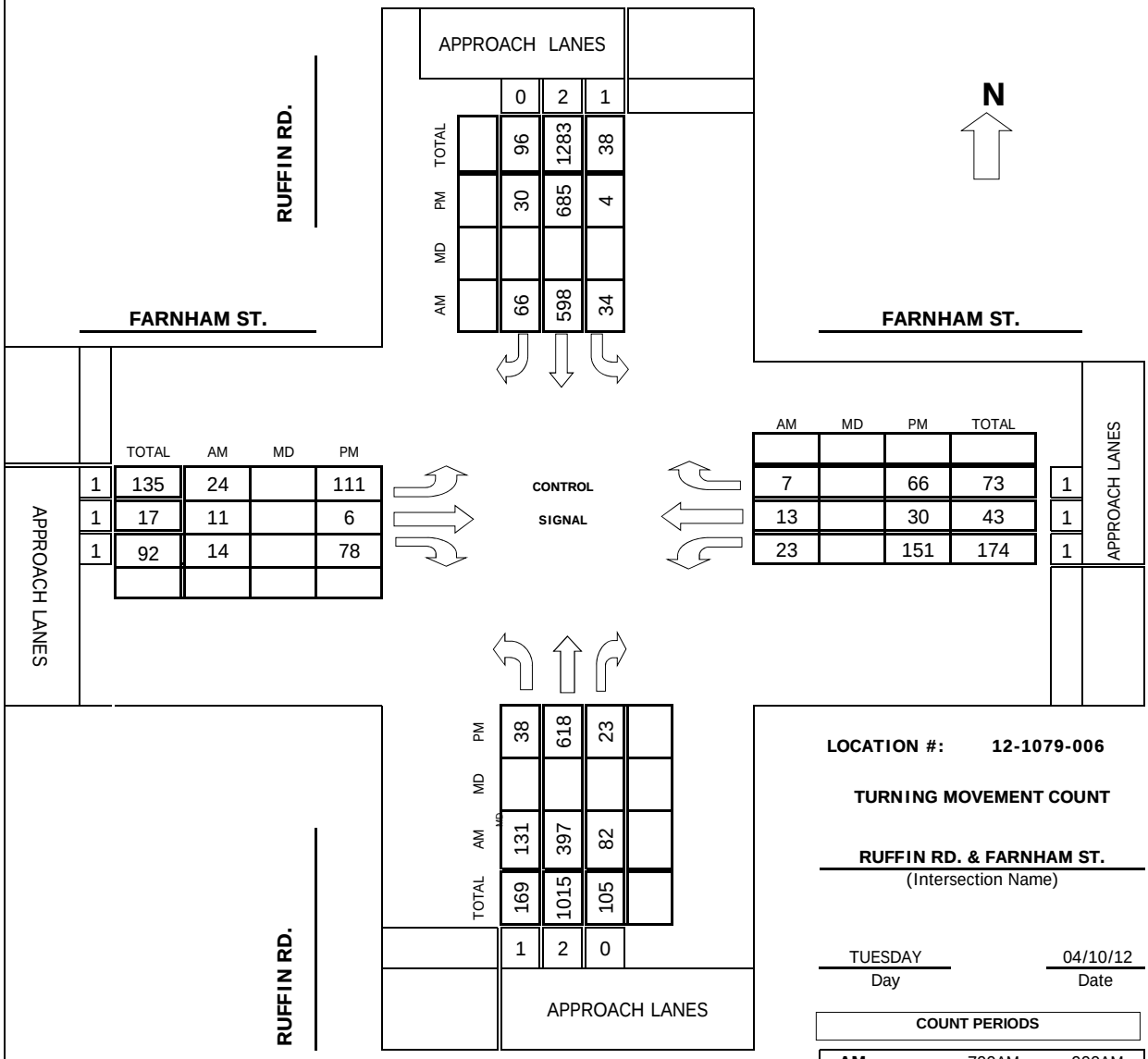
AM PEAK HOUR	715 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1079-006

TMC SUMMARY OF RUFFIN RD. & FARNHAM ST.



LOCATION #: 12-1079-006

TURNING MOVEMENT COUNT

RUFFIN RD. & FARNHAM ST.
(Intersection Name)

TUESDAY — Day
04/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 715 AM

NOON PEAK HOUR:

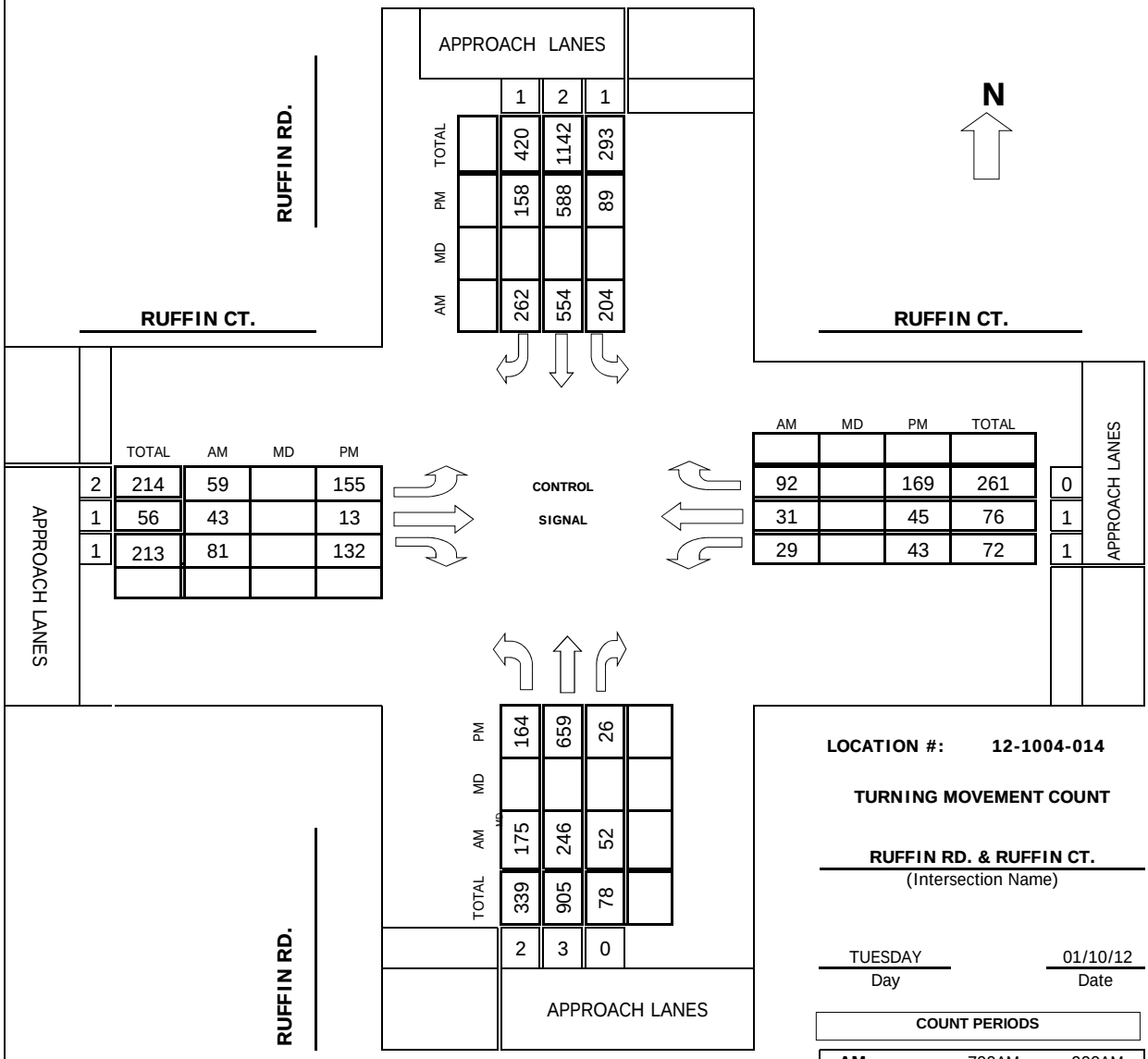
PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-014

TMC SUMMARY OF RUFFIN RD. & RUFFIN CT.



LOCATION #: 12-1004-014

TURNING MOVEMENT COUNT

RUFFIN RD. & RUFFIN CT.
(Intersection Name)

TUESDAY — Day
01/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 730 AM

NOON PEAK HOUR:

PM PEAK HOUR: 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-015

TMC SUMMARY OF RUFFIN RD. & SPECTRUM CENTER BLVD.

RUFFIN RD.

SPECTRUM CENTER BLVD.

N

APPROACH LANES

		1	2	1
TOTAL		132	1209	27
PM		28	754	15
MD				
AM		104	455	12

SPECTRUM CENTER BLVD.

APPROACH LANES

	TOTAL	AM	MD	PM
2	108	28		80
1	3	3		0
1	364	79		285

CONTROL SIGNAL

AM	MD	PM	TOTAL	
5		16	21	1
0		4	4	1
9		16	25	1

APPROACH LANES

RUFFIN RD.

PM	103	611	4	
MD				
AM	261	570	40	
TOTAL	364	1181	44	
	2	3	0	

APPROACH LANES

LOCATION #: 12-1004-015

TURNING MOVEMENT COUNT

RUFFIN RD. & SPECTRUM CENTER BLVD.
(Intersection Name)

TUESDAY — Day
01/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 745 AM

NOON PEAK HOUR:

PM PEAK HOUR: 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-016

TMC SUMMARY OF RUFFIN RD. & BALBOA AVE.

RUFFIN RD.

BALBOA AVE.

BALBOA AVE.

RUFFIN RD.

N

APPROACH LANES

	1	2	2
TOTAL	303	702	573
PM	209	432	482
MD			
AM	94	270	91

APPROACH LANES

	TOTAL	AM	MD	PM
1	320	178		142
3	1112	245		867
1	533	392		141

CONTROL SIGNAL

APPROACH LANES

	AM	MD	PM	TOTAL
2	519		221	740
3	838		479	1317
1	584		109	693

APPROACH LANES

	2	2	1
PM	417	435	351
MD			
AM	95	277	66
TOTAL	512	712	417

APPROACH LANES

LOCATION #: 12-1004-016

TURNING MOVEMENT COUNT

RUFFIN RD. & BALBOA AVE.
(Intersection Name)

TUESDAY — Day
01/10/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

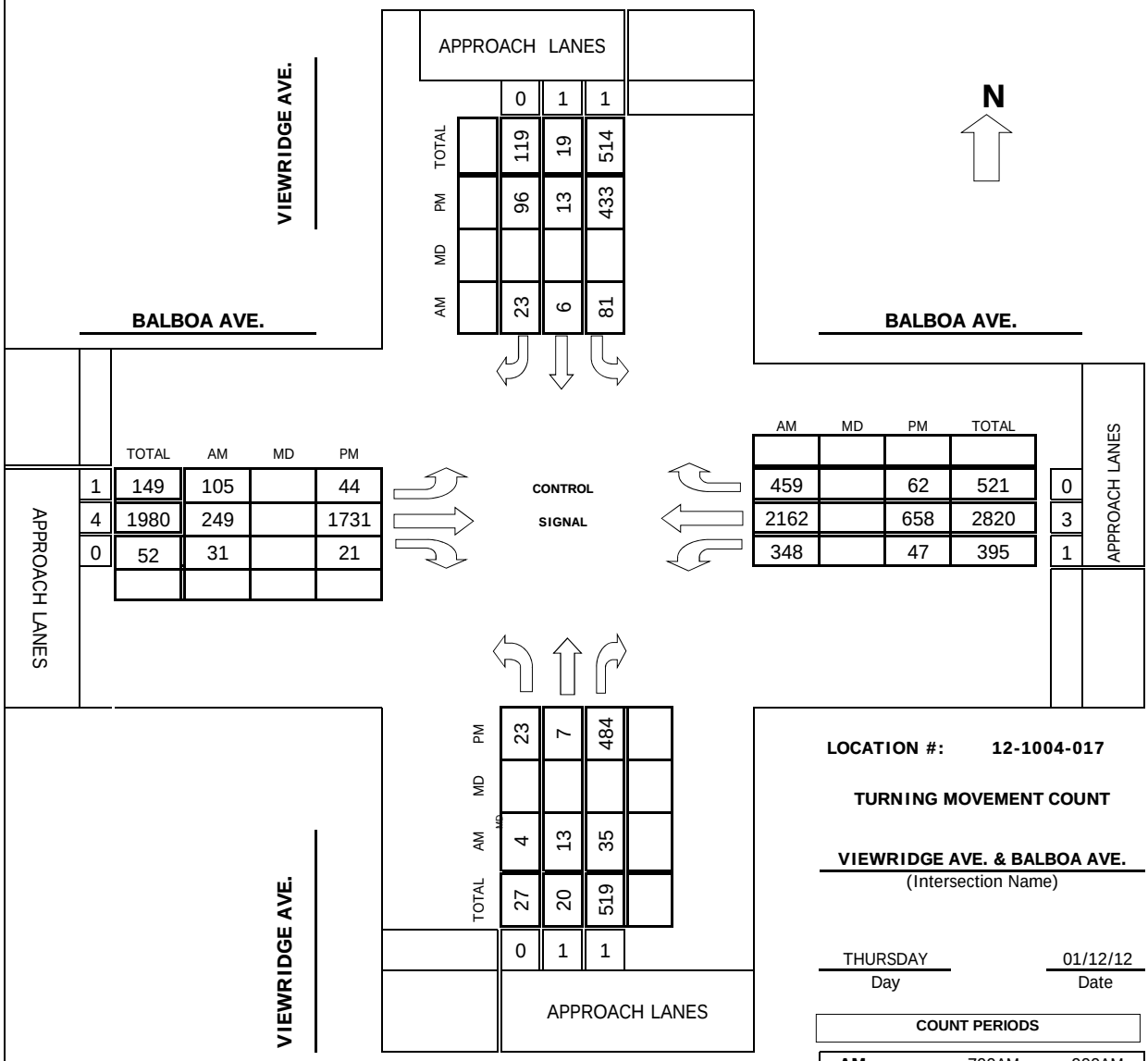
AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-017

TMC SUMMARY OF VIEWRIDGE AVE. & BALBOA AVE.



LOCATION #: 12-1004-017

TURNING MOVEMENT COUNT

VIEWRIDGE AVE. & BALBOA AVE.
(Intersection Name)

THURSDAY — Day
01/12/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 730 AM

NOON PEAK HOUR:

PM PEAK HOUR: 430 PM

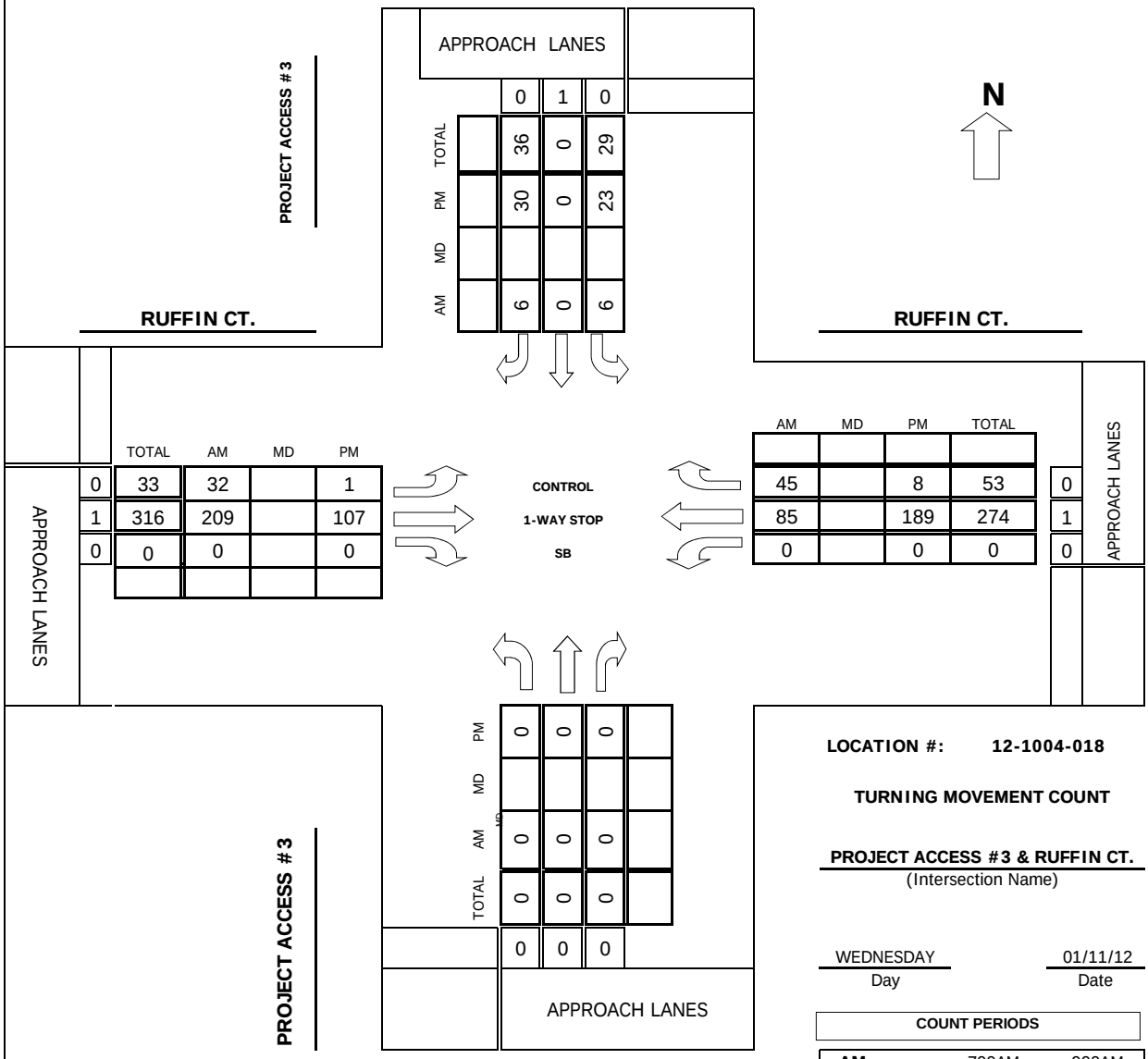
Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.0745

Project #: 12-1004-018

TMC SUMMARY OF PROJECT ACCESS #3 & RUFFIN CT.



	TOTAL	AM	MD	PM
	0	1		0
	36	0		29
	30	0		23
	6	0		6

	TOTAL	AM	MD	PM
0	33	32		1
1	316	209		107
0	0	0		0

	AM	MD	PM	TOTAL
0	45		8	53
1	85		189	274
0	0		0	0

	TOTAL	AM	MD	PM
	0	0		0
	0	0		0
	0	0		0
	0	0		0

LOCATION #: 12-1004-018

TURNING MOVEMENT COUNT

PROJECT ACCESS #3 & RUFFIN CT.
(Intersection Name)

WEDNESDAY — Day
01/11/12 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 715 AM

NOON PEAK HOUR:

PM PEAK HOUR: 430 PM

B – 2

SIGNAL TIMING PLANS FROM THE CITY OF SAN DIEGO AND CALTRANS

Intersections

1.	Clairemont Mesa Boulevard / Kearny Mesa Road	Coordinated
2.	Clairemont Mesa Boulevard / SR 163 SB Ramps (MSSC)	No Signal Timing Plan
3.	Clairemont Mesa Boulevard / SR 163 NB Ramps	Coordinated
4.	Clairemont Mesa Boulevard / Kearny Villa Road	Coordinated
5.	Clairemont Mesa Boulevard / Complex Drive	Coordinated
6.	Clairemont Mesa Boulevard / Overland Avenue	Coordinated
7.	Clairemont Mesa Boulevard / Ruffin Road	Coordinated
8.	Clairemont Mesa Boulevard / Project Main Access	No Signal Timing Plan
9.	Clairemont Mesa Boulevard / Murphy Canyon Road	Coordinated
10.	Clairemont Mesa Boulevard / I-15 SB Ramps	Coordinated
11.	Clairemont Mesa Boulevard / I-15 NB Ramps	Coordinated
12.	Lightwave Avenue / Overland Avenue	Free Operational
13.	Ruffin Road / SR 52 WB Ramps	Coordinated
14.	Ruffin Road / SR 52 EB Ramps	Coordinated
15.	Ruffin Road / Kearny Villa Road	Free Operational
16.	Ruffin Road / Chesapeake Drive	Free Operational
17.	Ruffin Road / Hazard Way	Free Operational
18.	Ruffin Road / Farnham Street	Free Operational
19.	Ruffin Road / Project Access	No Signal Timing Plan
20.	Ruffin Road / Ruffin Court	Free Operational
21.	Ruffin Road / Spectrum Center Boulevard	Free Operational
22.	Ruffin Road / Balboa Avenue	Free Operational
23.	Viewridge Avenue / Balboa Avenue	Free Operational
24.	Ruffin Court / Project Access	No Signal Timing Plan

NTERSECTION: CLAIREMONT MESA BI @ KEARNY ME RD

223 gram

Group Assignment:
Field Master Assignment:

N/S Street Name: KEARNY MESA Rd
E/W Street Name: CLAIREMONT MESA BI

Last Database Change:
System Ref. Number:

N

Row	Column # --->	1	2	3	4	5	6	7	8
		CLAIREMONT MESA			KEARNY MESA		CLAIREMONT MESA		KEARNY MESA
	Phase # --->	1+8						6+7	
0	Ped Walk		7		7		7		
1	Ped FDW		19		24		26		
2	Min Green	4	10	4	4	4	10	4	4
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.7	2.0	2.0	2.0	3.9	2.0	2.0
6	Max Gap	2.0	3.7	2.0	2.0	2.0	3.9	2.0	2.0
7	Min Gap	2.0	0.2	2.0	2.0	2.0	0.2	2.0	2.0
8	Max Limit	30	85	30	40	30	85	30	40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.8				0.8		
E	Yellow	3.4	4.2	3.4	3.9	3.4	4.8	3.4	4.2
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	
EV-B Clear	
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	_2_6_
5	Peds (View)	_2_4_6__
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2__6_
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2__6__
F	1st Phases	__4__8

Phase Functions <F Page>
F + F + Row

JM1 3/15/10

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	6	C + 0 + 0
Zone Number	6	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	5	C + 0 + 3
QuicNet Channel	DIGI:33	(QuicNet)

Communication Addresses

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O	F	Row
Free Lag	_2_45__8	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: WXW
Approved By: EFF
Drawing Number: 19789-D
Timing Implemented On: 11/15/2004

INTERSECTION: CLAIREMONT MESA BI @ KEARNY MESA RD — 223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recell
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	_____6__
7	Ped 4P	___4____
8	Ped 8P	
9	Yellow Flash Phases	
A	Overlap A - Phases	1_____8
B	Overlap B - Phases	_____67_
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1_____

Configuration

<E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	_____8
6	Overlap B - Green Omit	_____6__
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5___
B	EV-B Phases	
C	EV-C Phases	1____6__
D	EV-D Phases	__3____8
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

For access, set F + 9 + E = 1

Configuration

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		TEMP 1.8
7		
8		
9		
A		
B	10.0	
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CLAIREMONT MESA BI @ KEARNY MESA RD

223 Program

1

Coordination Timing By: WXW
Implemented On: 11/15/2004

Row	Column # --->	Plan 1	2	3	4	5	6	7	8	9
	Plan Name --->									
0	Cycle Length	110	130	135						
1	Phase 1 - ForceOff	24	71	22						
2	Phase 2 - ForceOff	0	0	0						
3	Phase 3 - ForceOff	42 ~~39~~	16	50						
4	Phase 4 - ForceOff	74	51	86						
5	Phase 5 - ForceOff	90	69	104						
6	Phase 6 - ForceOff	0	0	0						
7	Phase 7 - ForceOff	42 ~~39~~	26	57						
8	Phase 8 - ForceOff	74	51	86						
9	Ring Offset									
A	Offset A	122	0	19						
B	Offset B									
C	Offset C									
D	Permissive	11	13	14						
E	Hold Release	255	255	255						
F	Ped Shift	0	0	0						

Coordination <C Page>
C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 00	1	A	23456
1	10 : 00	2	A	23456
2	14 : 00	3	A	23456
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination
<9 Key with C+0+9=1>

	E	Row		F
		0	Free Lag	
Plan 1	2 6	1	Plan 1 - Lag	1 4 6 8
Plan 2	2 6	2	Plan 2 - Lag	2 4 6 8
Plan 3	2 6	3	Plan 3 - Lag	1 4 6 8
Plan 4		4	Plan 4 - Lag	
Plan 5		5	Plan 5 - Lag	
Plan 6		6	Plan 6 - Lag	
Plan 7		7	Plan 7 - Lag	
Plan 8		8	Plan 8 - Lag	
Plan 9		9	Plan 9 - Lag	
Coord Ped*		A	Coord Max *	
NEMA Hold		B	Coord Lag *	
		C		
		D		
		E		
		F		

Sync Phases
C + E + FUNCTION #

Lag Phases <C Page>
C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

TION: RTE 163 NB @ CLAIRMONT MESA BLVD

RANS C8 Version 3 DATE: 8/12/2011 PAGE 1

GE

NTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
ALK	1	7	1	1	1	7	1	1	CLK RST
ONT WALK	1	26	1	1	1	10	1	1	
IN GREEN	5	10	1	1	1	10	1	5	
YPE 3 DET	0	0	0	0	0	0	0	0	
DD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ASSAGE	2.0	2.0	0.9	0.9	0.9	2.0	0.9	2.0	
AX GAP	2.0	2.0	0.9	0.9	0.9	2.0	0.9	2.0	
IN GAP	2.0	2.0	0.9	0.9	0.9	2.0	0.9	2.0	
AX EXT	20	40	9	9	9	40	9	35	
AX 2									YR
AX 3									MO
									DAY
EDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
ELLOW	3.2	4.3	3.0	3.0	3.0	4.3	3.0	3.5	MIN
ED	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0	SEC
ED XING FT		113				41			
IKE XING FT		120				67			

PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
RR1 CLR	5	RED LOCK									1
EVA DLY	0	YEL LOCK									2
EVA CLR	5	V RECALL		2				6			3
EVB DLY	0	P RECALL									4
EVB CLR	5	PED PHASES		2				6			5
EVC DLY	0	RT OLA									6
EVC CLR	5	RT OLB									7
EVD DLY	0	DBL ENTRY									8
EVD CLR	5	MAX 2 PHASES									9
MAX EV	255	LAG PHASES	READ ONLY								A
RR2 CLR	5	RED REST									B
		REST-IN-WALK									C
		MAX 3 PHASES									D
		YEL START UP		2				6			E
		FIRST PHASE								8	F
			1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

OTES:

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

3

LOCATION: RTE 163 NB @ CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: 11/14/2006 PAGE 2

C PAGE

(3)

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	110														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR	15												GAPOUT CP1		LAG FZ CP 1		2		4		6		8	1
2														GAPOUT CP2		LAG FZ CP 2									2
3	FZ3 GRN FCTR	0												GAPOUT CP3		LAG FZ CP 3									3
4	FZ4 GRN FCTR	0									PERM TIME			GAPOUT CP4		LAG FZ CP 4									4
5	FZ5 GRN FCTR	0									LAG OFFSET			GAPOUT CP5		LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6		LAG FZ CP 6									6
7	FZ7 GRN FCTR	0									LONG GRN			GAPOUT CP7		LAG FZ CP 7									7
8	FZ8 GRN FCTR	30									NO GREEN			GAPOUT CP8		LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9		LAG FZ CP 9									9
A	OFFSET A	75									OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		2				6			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

COO =

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

)CATION: RTE 163 NB @ CLAIRMONT MESA BLVD

LTRANS C8 Version 3 DATE: 11/14/2006 PAGE 3

PAGE

D	FLAGS							
MAX	1	2	3	4	5	6	7	8
RCL								
CP 1								
CP 2								
CP 3								
CP 4								
CP 5								
CP 6								
CP 7								
CP 8								
CP 9								
	1	2	3	4	5	6	7	8

E	FLAGS							
MIN	1	2	3	4	5	6	7	8
RCL								
CP 1								
CP 2								
CP 3								
CP 4								
CP 5								
CP 6								
CP 7								
CP 8								
CP 9								
	1	2	3	4	5	6	7	8

F	FLAGS							
PED	1	2	3	4	5	6	7	8
RCL								
CP 1								
CP 2								
CP 3								
CP 4								
CP 5								
CP 6								
CP 7								
CP 8								
CP 9								
RCL 1								
RCL 2								
	1	2	3	4	5	6	7	8

E PAGE

	E FUNCTION	FLAGS 1	2	3	4	5	6	7	8	F FUNCTION	FLAGS 1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

CATION: RTE 163 NB @ CLAIRMONT MESA BLVD

LTRANS C8 Version 3 DATE: 11/14/2006

PAGE 9 PAGE C09 = 0 or 1 9 PAGE C09 = 2 PAGE 4

3

TIME OF DAY ACTIVITY TABLE

EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS

HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7

CONTROL PLAN TIME OF DAY

9+EVENT+HR+MIN+CP+OS+E+DOW

	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	06	00	1	A		2	3	4	5	6	
1	10	00	E	A		2	3	4	5	6	
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

CONTROL PLAN TIME OF DAY

9+EVENT+HR+MIN+CP+OS+E+DOW

	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

TYPE OF MAX TERMINATION

MAX 2

MAX 3

COND SERV (1ST SELECT)

COND SERV (2ND SELECT)

ENERGIZE AUX OUTPUT-RED

ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)

A TRAFFIC ACT. MAX 2 OPERATION

B TIME OF DAY MAX RECALL (2ND SELECT)

C YELLOW YIELD COORDINATION

D YELLOW YIELD COORDINATION

E TIME OF DAY FREE OPERATION

F FLASHING OPERATION

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	163	13.5/14.4	136	

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER JON COLLINS No. 62090 Exp. 06-30-05 CIVIL STATE OF CALIFORNIA

CITY OF SAN DIEGO
1010 SECOND Ave
SAN DIEGO, CA 92101

KIMLEY-HORN AND ASSOCIATES, INC.
517 FOURTH Ave SUITE 301
SAN DIEGO, CA 92101

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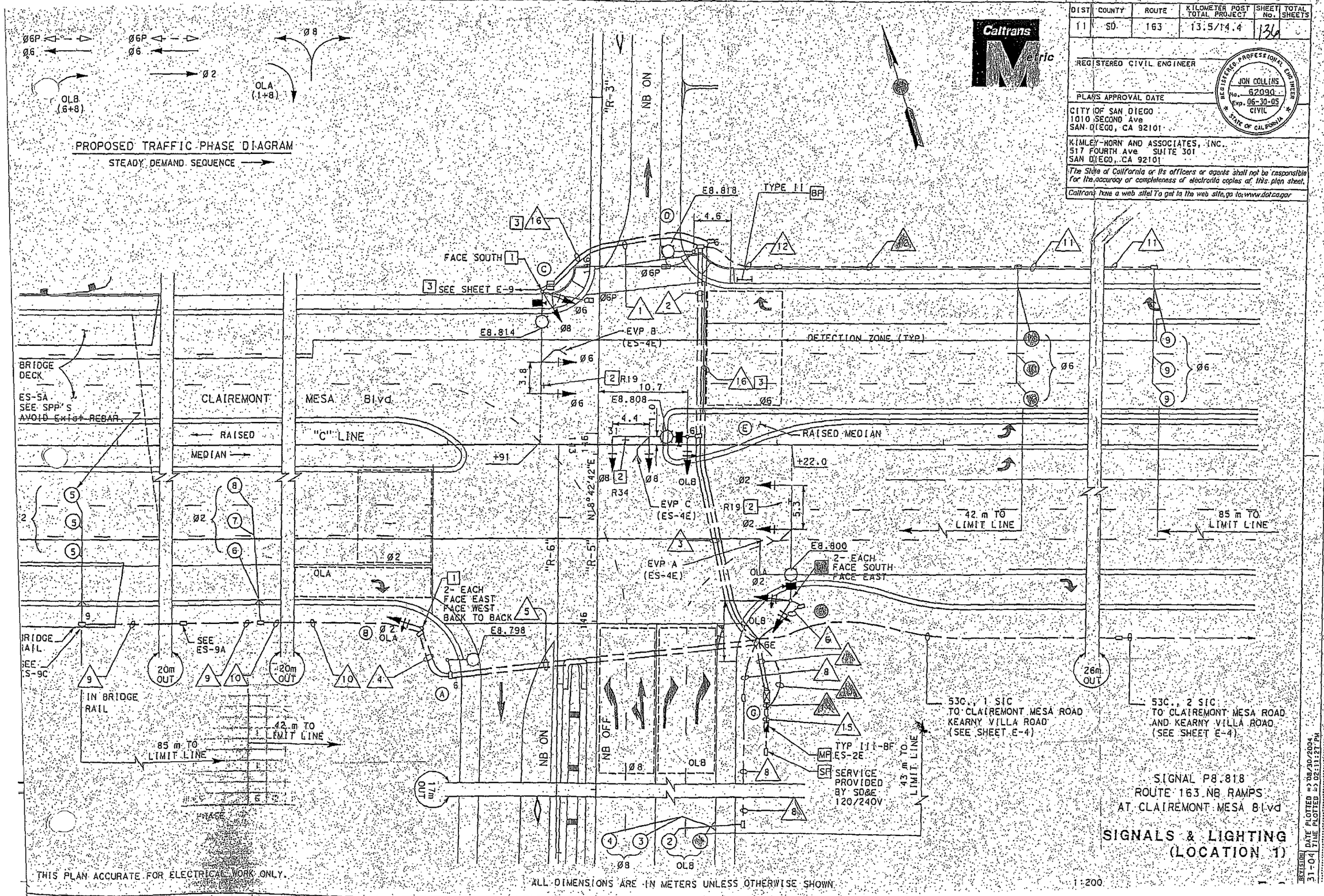
Caltrans Metric



THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

REVISION 31-04 DATE PLOTTED => 08/30/2004 TIME PLOTTED => 02:11:27 PM

LAST REVISION

INTERSECTION: CLAIREMONT MESA BI @ KEARNY VILLA Rd

223 Program

(4)

Group Assignment:
Field Master Assignment:

N/S Street Name: KEARNY VILLA Rd
E/W Street Name: CLAIREMONT MESA BI

Last Database Change:
System Ref. Number:

N

2) JMV 6/27/07 PED PHASE ADDED

1) WH 7/15/03

Row	Phase # --->	1	2	3	4	5	6	7	8
	Column # --->		CLAIREMONT MESA BI	KEARNY VILLA Rd	KEARNY VILLA Rd		CLAIREMONT MESA BI		
0	Ped Walk		7				2 7		7
1	Ped FDW		22				6 28		2 29 ~~30~~
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Limit								
4	Add/Veh								~~2.0~~
5	Veh Extn	2.0	3.7	2.0	4.7	2.0	4.2	2.0	4.2 ~~6.4~~
6	Max Gap	2.0	3.7 ~~5.0~~	2.0	4.7	2.0	4.2	2.0	4.2 ~~6.4~~
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	40	40 ~~30~~	60	30	40
9	Max Limit 2					BG 11-5-07			
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		0.9		0.7		0.8 ~~0.7~~		0.8 ~~0.5~~
E	Yellow	1 3.4	4.0 ~~4.2~~	1 3.4	4.2	1 3.4	4.1 ~~4.2~~	1 3.4	4.4
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2___6__
4	Ped Recall	
5	Peds (View)	_2___6___8
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	__3___7_

EFP 2/22/05

Phase Functions <F Page>
F + F + Row

Max Initial	0 ~~35~~	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	7	C + 0 + 0
Zone Number	7	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	4	C + 0 + 3
QuicNet Channel	DIGI:33	(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	~~0~~ 14	C + A + 1
Manual Offset	0	C + B + 1

BC

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: WXW
Approved By: EFF
Drawing Number: 30794-11-D
Timing Implemented On: 11/15/2004

INTERSECTION: CLAIREMONT MESA BI @ KEARNY VILLA Rd

223 Program

(4)

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6 (2)
7	Ped 4P	
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

<E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

For access, set F + 9 + E = 1

Configuration

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

(4)

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A	10.0	
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
1		
2	System Det. # 1	0
3	System Det. # 2	0
4	System Det. # 3	0
5	System Det. # 4	0
6	System Det. # 5	0
7	System Det. # 6	0
8	System Det. # 7	0
9	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CLAIREMONT MESA BI @ KEARNY VILLA Rd

223 Program

(4)

Coordination Timing By: WXW
Implemented On: 11/16/2004

Row	Column # ---> / Plan Name --->	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8	Plan 9
0	Cycle Length	110	130	135						
1	Phase 1 - ForceOff	95	22	116						
2	Phase 2 - ForceOff	0	0	0						
3	Phase 3 - ForceOff	38	42	59						
4	Phase 4 - ForceOff	80	82	101						
5	Phase 5 - ForceOff	24	112	33						
6	Phase 6 - ForceOff	0	0	0						
7	Phase 7 - ForceOff	38	39	59						
8	Phase 8 - ForceOff	80	82	101						
9	Ring Offset									
A	Offset A	14	52	17						
B	Offset B									
C	Offset C									
D	Permissive	11	13	14						
E	Hold Release	255	255	255						
F	Ped Shift	0	0	0						

Coordination <C Page>

C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 00	1	A	_23456_
1	10 : 00	2	A	_23456_
2	14 : 00	3	A	_23456_
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination

<9 Key with C+0+9=1>

	E
Plan 1	_2___6__
Plan 2	_2___6__
Plan 3	_2___6__
Plan 4	
Plan 5	
Plan 6	
Plan 7	
Plan 8	
Plan 9	
Coord Ped*	
NEMA Hold	

Sync Phases

C + E + FUNCTION #

Row		F
0	Free Lag	
1	Plan 1 - Lag	_2_45__8
2	Plan 2 - Lag	1__4_6_8
3	Plan 3 - Lag	_2_45__8
4	Plan 4 - Lag	
5	Plan 5 - Lag	
6	Plan 6 - Lag	
7	Plan 7 - Lag	
8	Plan 8 - Lag	
9	Plan 9 - Lag	
A	Coord Max *	
B	Coord Lag *	
C		
D		
E		
F		

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type
0 = Shortway
Non-zero = Lengthen

NTERSECTION: CLAIREMONT MESA Bl @ COMPLEX D OMPLEX St

223 gram

5

Group Assignment:
Field Master Assignment:

N/S Street Name: COMPLEX Dr/ COMPLEX St
E/W Street Name: CLAIREMONT MESA Bl

Last Database Change:
System Ref. Number:

Row	Column # --->	1	2	3	4	5	6	7	8
	Phase # --->	1	2	3	4	5	6	7	8
			CLAIREMONT MESA		COMPLEX		CLAIREMONT MESA		
0	Ped Walk		7		7		7		
1	Ped FDW		13		30		12		
2	Min Green	4	10		4	4	10		
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.7		2.0	2.0	2.6		
6	Max Gap	2.0	3.7		2.0	2.0	2.6		
7	Min Gap	2.0	0.2		2.0	2.0	0.2		
8	Max Limit	30	60		40	30	60		
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.9				1.3		
E	Yellow	3.4	4.1		3.9	3.4	4.2		
F	Red Clear	1.0	1.0		1.0	1.0	1.0		
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	
EV-B Clear	
EV-C Delay	0
EV-C Clear	0
EV-D Delay	
EV-D Clear	
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12_456__
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2_ 6_
4	Ped Recall	
5	Peds (View)	_2_4_6__
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	~~2~~ ~~6~~
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2__6__
F	1st Phases	___4____

Phase Functions <F Page>
F + F + Row

4/12/05

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	8	C + 0 + 0
Zone Number	8	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	3	C + 0 + 3
QuicNet Channel	DIGI:33	(QuicNet)

Communication Addresses

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O

	F	Row
Free Lag	_2_4_6__	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: WXW
Approved By: EFF
Drawing Number: 30311-10-D
Timing Implemented On: 11/15/2004

INTERSECTION: CLAIREMONT MESA BI @ COMPLEX Dr/ COMPLEX St

223 Program (5)

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4
C	EV-C Phases	1 6
D	EV-D Phases	
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

For access, set F + 9 + E = 1

Configuration

E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

5

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7	10.0	
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CLAIREMONT MESA Bl @ COMPLEX Dr/ COMPLEX St — 223 Program

5

Coordination Timing By: WXW
Implemented On: 11/15/2004

Row	Column # --->	Plan 1	2	3	4	5	6	7	8	9
	Plan Name --->									
0	Cycle Length	110	130	135						
1	Phase 1 - ForceOff	65	67	108						
2	Phase 2 - ForceOff	0	0	34 ~~0~~						
3	Phase 3 - ForceOff									
4	Phase 4 - ForceOff	42	44	85						
5	Phase 5 - ForceOff	80	87	34						
6	Phase 6 - ForceOff	0	0	0						
7	Phase 7 - ForceOff									
8	Phase 8 - ForceOff									
9	Ring Offset									
A	Offset A	99	69	15						
B	Offset B									
C	Offset C									
D	Permissive	11	13	14						
E	Hold Release	255	255	255						
F	Ped Shift	~~10~~	0	0						

Coordination <C Page>
C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 00	1	A	_23456_
1	10 : 00	2	A	_23456_
2	14 : 00	3	A	_23456_
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination
<9 Key with C+0+9=1>

	E	Row		F
		0	Free Lag	
Plan 1	_2__6__	1	Plan 1 - Lag	_2_4_6__
Plan 2	_2__6__	2	Plan 2 - Lag	_2_4_6__
Plan 3	~~2~~ 6__	3	Plan 3 - Lag	_2_45___
Plan 4		4	Plan 4 - Lag	
Plan 5		5	Plan 5 - Lag	
Plan 6		6	Plan 6 - Lag	
Plan 7		7	Plan 7 - Lag	
Plan 8		8	Plan 8 - Lag	
Plan 9		9	Plan 9 - Lag	
Coord Ped*		A	Coord Max *	
NEMA Hold		B	Coord Lag *	
		C		
		D		
		E		
		F		

Sync Phases
C + E + FUNCTION #

Lag Phases <C Page>
C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type
0 = Shortway
Non-zero = Lengthen

NTERSECTION: CLAIREMONT MESA BI @ OVERLAND

223 gram

(6)

Group Assignment:
Field Master Assignment:

N/S Street Name: OVERLAND Ave
E/W Street Name: CLAIREMONT MESA BI

Last Database Change:
System Ref. Number:

Row	Column # --->	1	2	3	4	5	6	7	8
	Phase # --->	1	2	3	4	5	6	7	8
		CLAIREMONT MESA			OVERLAND		CLAIREMONT MESA		OVERLAND
0	Ped Walk		7		7		7		7
1	Ped FDW		20		29		14		29
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	4.9	2.0	2.0	2.0	4.9	2.0	5.5
6	Max Gap	2.0	4.9	2.0	2.0	2.0	4.9	2.0	5.5
7	Min Gap	2.0	0.2	2.0	2.0	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	60	30	60	30	60
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		0.1
D	Every		0.6				0.6		0.6
E	Yellow	3.4	4.0	3.4	3.9	3.4	4.1	3.4	3.9
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2__6__
4	Ped Recall	
5	Peds (View)	_2_4_6_8
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2__6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2__6__
F	1st Phases	__3__7_

Phase Functions <F Page>
F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	9	C + 0 + 0
Zone Number	9	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	2	C + 0 + 3
QuicNet Channel	DIGI:33	(QuicNet)

Communication Addresses

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: WXW
Approved By: EFF
Drawing Number: 29738-43-D
Timing Implemented On: 11/15/2004

INTERSECTION: CLAIREMONT MESA BI @ OVERLAND Ave

223 Program

(6)

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	_____6__
7	Ped 4P	___4____
8	Ped 8P	_____8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5___
B	EV-B Phases	___4__7_
C	EV-C Phases	1____6__
D	EV-D Phases	__3____8
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

6

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A	10.0	
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		1.8
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
1		
2	System Det. # 1	0
3	System Det. # 2	0
4	System Det. # 3	0
5	System Det. # 4	0
6	System Det. # 5	0
7	System Det. # 6	0
8	System Det. # 7	0
	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CLAIREMONT MESA BI @ OVERLAND Ave

223 Program

(6)

Coordination Timing By: WXW
Implemented On: 11/15/2004

Row	Column # --->	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8	Plan 9
	Plan Name --->									
0	Cycle Length	110	130	135						
1	Phase 1 - ForceOff	71	(2) 85 ~~81~~	17						
2	Phase 2 - ForceOff	0	0	0						
3	Phase 3 - ForceOff	(1) 19 ~~15~~	(2) 27 ~~19~~	37						
4	Phase 4 - ForceOff	56	59	80						
5	Phase 5 - ForceOff	71	(2) 81 ~~77~~	96						
6	Phase 6 - ForceOff	0	0	0						
7	Phase 7 - ForceOff	(2) 19 ~~15~~	(2) 28 ~~18~~	37						
8	Phase 8 - ForceOff	56	59	80						
9	Ring Offset									
A	Offset A	101	55	92						
B	Offset B									
C	Offset C									
D	Permissive	11	(2) 13	14						
E	Hold Release	255	125 ~~255~~	255						
F	Ped Shift	(1) 4 ~~0~~	(2) 6 ~~0~~	0						

Coordination <C Page>

C + Plan + ROW

(1) FLG 10-30-03

(2) DRH 10-18-11

Row	Time	Plan	Offset	Day of Week
0	06 : 00	1	A	23456
1	10 : 00	2	A	23456
2	14 : 00	3	A	23456
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination

<9 Key with C+0+9=1>

	E	Row		F
		0	Free Lag	
Plan 1	2 6	1	Plan 1 - Lag	2 4 6 8
Plan 2	2 6	2	Plan 2 - Lag	2 4 6 8
Plan 3	2 6	3	Plan 3 - Lag	1 4 6 8
Plan 4		4	Plan 4 - Lag	
Plan 5		5	Plan 5 - Lag	
Plan 6		6	Plan 6 - Lag	
Plan 7		7	Plan 7 - Lag	
Plan 8		8	Plan 8 - Lag	
Plan 9		9	Plan 9 - Lag	
Coord Ped*		A	Coord Max *	
NEMA Hold		B	Coord Lag *	
		C		
		D		
		E		
		F		

Sync Phases

C + E + FUNCTION #

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type
0 = Shortway
Non-zero = Lengthen

y of San Dieg

.NTERSECTION: CLAIREMONT MESA BI @ RUFFIN Rd

223 gram

(7)

Group Assignment:
Field Master Assignment:

N/S Street Name: RUFFIN Rd
E/W Street Name: CLAIREMONT MESA BI

Last Database Change:
System Ref. Number:

Row	Column # --->	1	2	3	4	5	6	7	8
			CLAIREMONT MESA		RUFFIN		CLAIREMONT MESA		RUFFIN
	Phase # --->	1	2	3	4	5	6	7	8
0	Ped Walk		5		5		5		5
1	Ped FDW		28		27		23		28
2	Min Green	4	10	4	4	4	10	4	4
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.8	2.0	4.1	2.0	3.5	2.0	4.1
6	Max Gap	2.0	3.8	2.0	4.1	2.0	3.5	2.0	4.1
7	Min Gap	2.0	0.2	2.0	CU2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	40	40	30	60	30	40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		0.8		0.8		0.9		0.8
E	Yellow	3.4	4.2	3.4	4.4	3.4	4.1	3.4	4.6
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	
EV-B Clear	
EV-C Delay	
EV-C Clear	
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2___6_
4	Ped Recall	
5	Peds (View)	_2_4_6_8
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	__3___7_

Phase Functions <F Page>
F + F + Row

Max Initial		F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	10	C + 0 + 0
Zone Number	10	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	1	C + 0 + 3
QuicNet Channel	DIGI:33	(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	_2_4_6_8	0
	Lag Phases	<C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: WXW
Approved By: EFF
Drawing Number: 30311-11-D
Timing Implemented On: 11/15/2004

INTERSECTION: CLAIREMONT MESA BI @ RUFFIN Rd

223 Program

7

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

<E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

For access, set F + 9 + E = 1

Configuration

E + E + ROW

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

7

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8	10.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8	10.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
1		
2	System Det. # 1	0
3	System Det. # 2	0
4	System Det. # 3	0
5	System Det. # 4	0
6	System Det. # 5	0
7	System Det. # 6	0
8	System Det. # 7	0
	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CLAIREMONT MESA BL @ RUFFIN Rd

223 Program

7

Coordination Timing By: WXW
Implemented On: 11/15/2004

Row	Column # --->	Plan 1	2	3	4	5	6	7	8	9
	Plan Name --->									
0	Cycle Length	110	130	135						
1	Phase 1 - ForceOff	71	86	89						
2	Phase 2 - ForceOff	0	0	0						
3	Phase 3 - ForceOff	15	29	21						
4	Phase 4 - ForceOff	53	65	68						
5	Phase 5 - ForceOff	71	91	89						
6	Phase 6 - ForceOff	0	0	0						
7	Phase 7 - ForceOff	15	27	30						
8	Phase 8 - ForceOff	53	65	68						
9	Ring Offset									
A	Offset A	83	93	96						
B	Offset B									
C	Offset C									
D	Permissive	11	13	14						
E	Hold Release	255	255	255						
F	Ped Shift	0	0	0						

Coordination <C Page>
C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 00	1	A	23456
1	10 : 00	2	A	23456
2	14 : 00	3	A	23456
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination
<9 Key with C+0+9=1>

	E	Row		F
		0	Free Lag	
Plan 1	2 6	1	Plan 1 - Lag	2 4 6 8
Plan 2	2 6	2	Plan 2 - Lag	2 4 6 8
Plan 3	2 6	3	Plan 3 - Lag	2 4 6 8
Plan 4		4	Plan 4 - Lag	
Plan 5		5	Plan 5 - Lag	
Plan 6		6	Plan 6 - Lag	
Plan 7		7	Plan 7 - Lag	
Plan 8		8	Plan 8 - Lag	
Plan 9		9	Plan 9 - Lag	
Coord Ped*		A	Coord Max *	
NEMA Hold		B	Coord Lag *	
		C		
		D		
		E		
		F		

Sync Phases
C + E + FUNCTION #

Lag Phases <C Page>
C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Plan Select
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type
0 = Shortway
Non-zero = Lengthen

INTERSECTION: CLAIREMONT MESA BI @ MURPHY CANYON Rd

223 gram

(9)

Group Assignment:
Field Master Assignment:

N/S Street Name: MURPHY CANYON Rd
E/W Street Name: CLAIREMONT MESA BI

Last Database Change:
System Ref. Number:

Row	Column # ——>	1	2	3	4	5	6	7	8
		CLAIREMONT MESA			MURPHY CANYON		CLAIREMONT MESA		
	Phase # ——>	1	2	3	4	5	6	7	8
0	Ped Walk		7		4		7		
1	Ped FDW		14		29		10		
2	Min Green	4	10		4	4	10		
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	6.3		2.0	2.0	6.1		
6	Max Gap	2.0	6.3		2.0	2.0	6.1		
7	Min Gap	2.0	0.2		2.0	2.0	0.2		
8	Max Limit	30	60		40	30	60		
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.5				0.5		
E	Yellow	3.4	4.7		4.3	3.4	4.1		
F	Red Clear	1.0	1.0		1.0	1.0	1.0		
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	
EV-B Clear	
EV-C Delay	0
EV-C Clear	0
EV-D Delay	
EV-D Clear	
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12_456__
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2___6__
4	Ped Recall	
5	Peds (View)	_2_4_6__
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	___4____

Phase Functions <F Page>
F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	11	C + 0 + 0
Zone Number	11	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	34	C + 0 + 3
QuicNet Channel	DIGI:33	(QuicNet)

Communication Addresses

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O	F	Row
Free Lag	_2_4_6__	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	234

Disable Communication Ports
D + D + 9

Timing Sheet By: WXW
Approved By: EFF
Drawing Number:
Timing Implemented On: 11/15/2004

INTERSECTION: CLAIREMONT MESA BI @ MURPHY CANYON Rd

223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
O = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	
C	EV-C Phases	1 6
D	EV-D Phases	
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

(9)

Row	1 Delay	3 Carry-over
0		
1		1.8
2		1.8
3		1.8
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		1.8
3		1.8
4		
5		
6		
7	10.0	
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CLAIREMONT MESA BL @ MURPHY CANYON Rd

223 Program

(9)

Coordination Timing By: **WXW**
Implemented On: **11/15/2004**

Row	Column # --->	Plan 1	2	3	4	5	6	7	8	9
	Plan Name ---->									
0	Cycle Length	110	130	135						
1	Phase 1 - ForceOff	80	83	81						
2	Phase 2 - ForceOff	0	0	0						
3	Phase 3 - ForceOff									
4	Phase 4 - ForceOff	40	47	40						
5	Phase 5 - ForceOff	54	63	56						
6	Phase 6 - ForceOff	0	0	0						
7	Phase 7 - ForceOff									
8	Phase 8 - ForceOff									
9	Ring Offset									
A	Offset A	97	127	119						
B	Offset B									
C	Offset C									
D	Permissive	11	13	14						
E	Hold Release	255	255	255						
F	Ped Shift	0	0	0						

Coordination <C Page>

C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan	C + A + 2
Current Plan	C + A + 3
Next Plan	C + A + 4
T.O.D. Plan	C + A + 5
Master Cycle	C + A + 0
Ring A Cycle	C + B + 0
Ring B Cycle	C + D + 0
Min Cycle	C + A + E
Max Cycle	C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 00	1	A	_23456_
1	10 : 00	2	A	_23456_
2	14 : 00	3	A	_23456_
3	19 : 00	E	A	1234567
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination

<9 Key with C+0+9=1>

	E
Plan 1	_2__6__
Plan 2	_2__6__
Plan 3	_2__6__
Plan 4	
Plan 5	
Plan 6	
Plan 7	
Plan 8	
Plan 9	
Coord Ped*	
NEMA Hold	

Sync Phases

C + E + FUNCTION #

Row		F
0	Free Lag	
1	Plan 1 - Lag	_2_4_6__
2	Plan 2 - Lag	_2_4_6__
3	Plan 3 - Lag	_2_4_6__
4	Plan 4 - Lag	
5	Plan 5 - Lag	
6	Plan 6 - Lag	
7	Plan 7 - Lag	
8	Plan 8 - Lag	
9	Plan 9 - Lag	
A	Coord Max *	
B	Coord Lag *	
C		
D		
E		
F		

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type	0

TBC Transition
C + D + D

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type
0 = Shortway
Non-zero = Lengthen

LOCATION: RTE 15 SB / CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: 5/11/2011 PAGE 1

F PAGE

10

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	7	1	1	CLK RST
1	DONT WALK	1	10	1	1	1	10	1	1	
2	MIN GREEN	5	10	1	5	1	10	1	1	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	2.0	2.0	0.9	2.0	0.9	2.0	0.9	0.9	
6	MAX GAP	2.0	2.0	0.9	2.0	0.9	2.0	0.9	0.9	
7	MIN GAP	2.0	2.0	0.9	2.0	0.9	2.0	0.9	0.9	
8	MAX EXT	30	50	9	35	9	50	9	9	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.2	5.0	3.0	3.6	3.0	5.0	3.0	3.0	MIN
F	RED	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0	SEC
	PED XING FT		60				57			
	BIKE XING FT		91				77			

PRE-EMPTION E	
EV SEL	0
RR1 CLR	5
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	5

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT	1	2	3	4	5	6	7	8	0
RED LOCK	1			4					1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE				4					F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	25
FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0
FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1
CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS ARE NOT TO BE CHANGED

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 15 SB / CLAIRMONT MESA BLVD

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C PAGE

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		CONTROL PLANS									Y-COORD			LAG PHASE		FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	80	60	80												LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR	30	15	15										GAPOUT CP1	0	LAG FZ CP 1		2		4		6		8	1
2														GAPOUT CP2	0	LAG FZ CP 2		2		4		6		8	2
3	FZ3 GRN FCTR	0	0	0										GAPOUT CP3	0	LAG FZ CP 3		2		4		6		8	3
4	FZ4 GRN FCTR	12	12	18							PERM TIME			GAPOUT CP4	0	LAG FZ CP 4									4
5	FZ5 GRN FCTR	0	0	0							LAG OFFSET			GAPOUT CP5	1	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	0	LAG FZ CP 6									6
7	FZ7 GRN FCTR	0	0	0							LONG GRN			GAPOUT CP7		LAG FZ CP 7									7
8	FZ8 GRN FCTR	0	0	0							NO GREEN			GAPOUT CP8		LAG FZ CP 8									8
9	MULTI CYCLE	0	0	0										GAPOUT CP9		LAG FZ CP 9									9
A	OFFSET A	0	0	0							OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		2				6			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
RTE 15 NB RAM

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		
3		
4		
5		
6		
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 15 SB / CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: ######## PAGE 3

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D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1	1								CP 1									CP 1								
2	CP 2									CP 2	1								CP 2								
3	CP 3									CP 3				4					CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E.

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 15 SB / CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: ########

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7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	06	30	1	A		2	3	4	5	6	
1	09	00	2	A	1	2	3	4	5	6	7
2	15	00	3	A		2	3	4	5	6	
3	18	30	E	A	1	2	3	4	5	6	7
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

(10)

○ EQUIPMENT SCHEDULE

STANDARD TYPE	MASTARM HT.	MASTARM SIG.	MASTARM LUM.	LUMINAIRE CO-HPS	PLACEMENT DIMENSIONS A.	PLACEMENT DIMENSIONS B.	SIGNAL MOUNTING AND PLACEMENT: VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	PEDESTRIAN LOC.	REMARKS
100	30'	60'	15'	250W	0'	7'	SV-1-T ø6*	MAS ø1●* MAS ø6* MAS ø6	SP-1-T ø6P*	ø6P*	1	RELOCATED EXISTING EQUIPMENT FROM POLE LOCATION Ⓐ AS NOTED. [3]
6-4-80	30'	40'	12'	150W	2.5'	5.5'	SV-1-T ø6■	MAS ø1●■ MAS ø6■	SP-1-T ø6P■	ø6P■	1	RELOCATE EXISTING EQUIPMENT TO POLE LOCATION Ⓐ AS NOTED.
1-A (10')	10'	--	--	--	SEE PLAN		TV-1-T ø4	-	SP-1-T ø6P	ø6P	5	EXISTING EQUIPMENT TO REMAIN
9-4-80	30'	25'	12' ■	150W	SEE PLAN		SV-2-TB ■ø2 ø4■	MAS ø2■	SP-1-T ø2P■	ø2P■	1 ■	RELOCATE EXISTING EQUIPMENT TO POLE LOCATION Ⓒ AS NOTED.
-4-100	30'	30'	12' *	250W	SEE PLAN		SV-2-TB *ø2 ø4*	MAS ø2*	SP-1-T ø2P*	ø2P*	1 *	RELOCATED EXISTING EQUIPMENT FROM POLE LOCATION Ⓒ AS NOTED.
7-3-80	30'	20'	12' ■	310W	9'	2.5'	SV-1-T ø4■	MAS ø4	-	-	-	RELOCATE EXISTING EQUIPMENT TO POLE LOCATION Ⓓ AS NOTED.
-4-100	30'	30'	12' *	250W	24'	5'	SV-1-T ø4*	MAS-4B ø4	-	-	-	RELOCATED EXISTING EQUIPMENT FROM POLE LOCATION Ⓓ AS NOTED. [4] [8]
1-A (10') *	10'	--	--	--	24'	4'	TV-1-T ø1●*	-	SP-1-T ø2P*	ø2P*	4 *	RELOCATED EXISTING EQUIPMENT FROM POLE LOCATION Ⓔ AS NOTED.
1-A (10') ■	10'	--	--	--	14.5'	5'	TV-1-T ø1●■	-	SP-1-T ø2P■	ø2P■	4 ■	RELOCATE EXISTING EQUIPMENT TO POLE LOCATION Ⓔ AS NOTED.
1-A (10')	10'	--	--	-	SEE PLAN		TV-2-T ●ø1 ø4	-	-	-	-	REMOVE AND SALVAGE ALL EXISTING EQUIPMENT

ED ARROW, YELLOW ARROW, GREEN ARROW
QUIPMENT RELOCATED FROM ■
QUIPMENT RELOCATED TO *

△ CONDUCTOR SCHEDULE*

AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE AND RUN 3" (1)	3" (2)	2-4" (3)	3" (4)	2-4" (5)
NO.14 CABLES		POLE – Ⓐ'				1	1
3 CONDUCTOR		POLE – Ⓑ			1	1	1
		POLE – Ⓒ	1	1	1	1	1
		POLE – Ⓓ		1	1		1
		POLE – Ⓔ			1	1	1
12 CONDUCTOR							
TOTAL CABLES – 3 CON / 12 CON			1 1	0 1	2 3	1 1	4 5
10	LUMINAIRES		2	2	2	2	0
4	SERVICE		0	0	0	2	2
TYPE "B" DLC	ø1	LOOP					
	ø2	LOOP			2		2
	ø4	LOOP					
	ø6	LOOP				2	2
	TOTAL		0	0	2	2	4
EV-DLC	ø1+ø6	EVPE					1
	ø2	EVPE					1
	ø4	EVPE		1	1		1
	TOTAL		0	1	1	0	3
VIDEO COAX			1	1	2	0	3
VIDEO POWER (3#16)			1	1	2	0	3
SIGNAL INTERCONNECT CABLE			0	0	0	1	1
CONDUIT FILL %			20	19	13	16	23
TOTAL CONDUCTORS / CABLES			6	5	14	9	25
*REMOVE ALL EXISTING CONDUCTORS PULL NEW CONDUCTORS AS SHOWN			NEW	NEW	NEW	NEW	NEW

WORK TO BE DONE:

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

1. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2006 EDITION (GREENBOOK), DOCUMENT NO. AEC1231061, FILED DECEMBER 31, 2006, INCLUDING THE REGIONAL AND CITY OF SAN DIEGO SUPPLEMENT, DOCUMENT NO. AEC1231062, FILED DECEMBER 31, 2006.
2. 1999 STANDARD SPECIAL PROVISIONS FOR SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS OF THE CITY OF SAN DIEGO, DOCUMENT NO. 769842, FILED OCTOBER 22, 1999.
3. CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (FHWA'S MUTCD 2003 EDRION, AS AMENDED FOR USE IN CALIFORNIA), DOCUMENT NO. AEC1231064, FILED DECEMBER 31, 2006.
4. STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED MAY 2006.

STANDARD DRAWINGS

1. CITY OF SAN DIEGO STANDARD DRAWINGS, INCLUDING ALL REGIONAL STANDARD DRAWINGS, DOCUMENT NO. AEC1231063, FILED DECEMBER 31, 2006.
2. STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD PLANS, DATED MAY 2006.

SPECIAL NOTE:

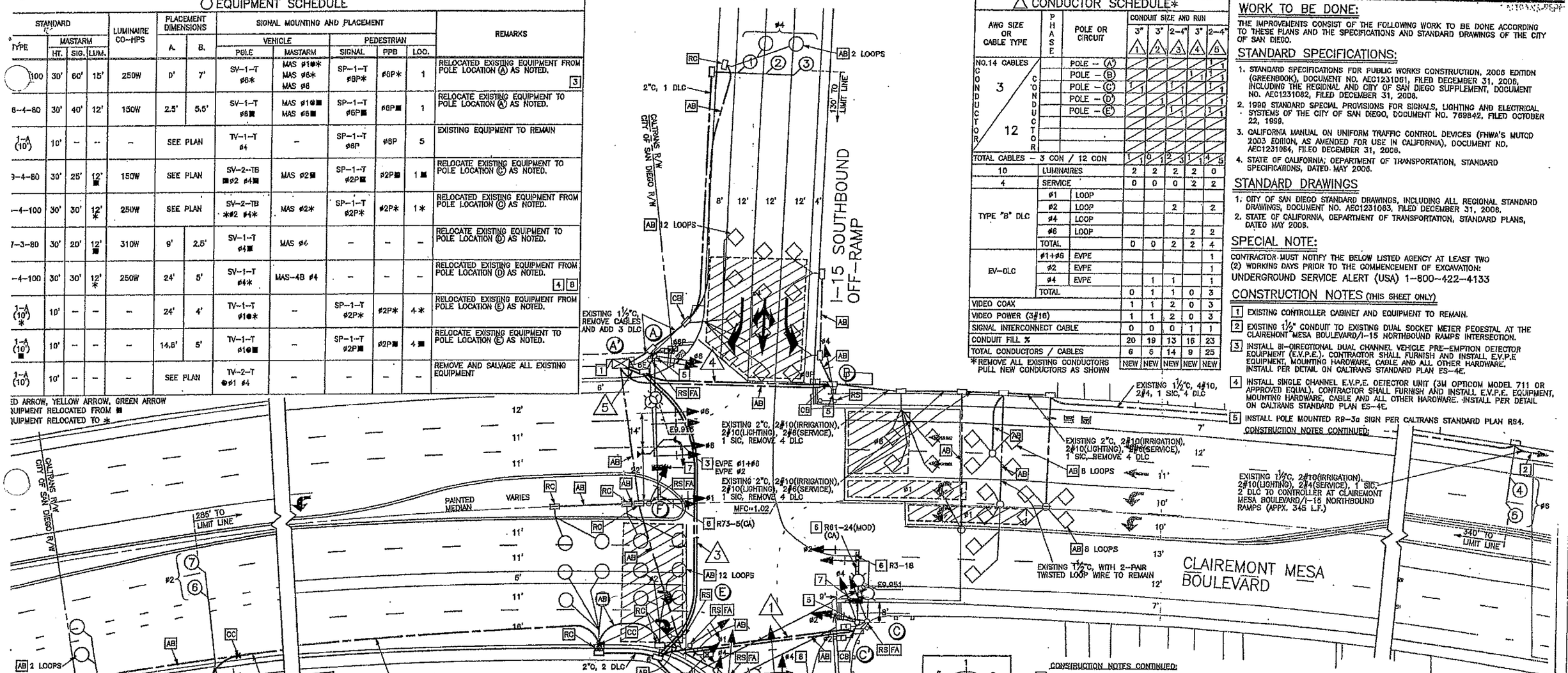
CONTRACTOR MUST NOTIFY THE BELOW LISTED AGENCY AT LEAST TWO (2) WORKING DAYS PRIOR TO THE COMMENCEMENT OF EXCAVATION:

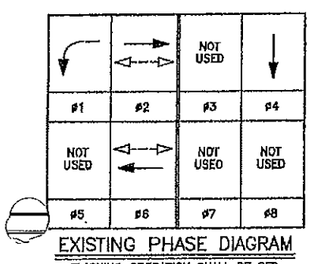
UNDERGROUND SERVICE ALERT (USA) 1-800-422-4133

CONSTRUCTION NOTES (THIS SHEET ONLY)

1. EXISTING CONTROLLER CABINET AND EQUIPMENT TO REMAIN.
2. EXISTING 1½" CONDUIT TO EXISTING DUAL SOCKET METER PEDESTAL AT THE CLAIREMONT MESA BOULEVARD/I-15 NORTHBOUND RAMPS INTERSECTION.
3. INSTALL BI-DIRECTIONAL DUAL CHANNEL VEHICLE PRE-EMPTION DETECTOR EQUIPMENT (E.V.P.E.). CONTRACTOR SHALL FURNISH AND INSTALL E.V.P.E EQUIPMENT, MOUNTING HARDWARE, CABLE AND ALL OTHER HARDWARE. INSTALL PER DETAIL ON CALTRANS STANDARD PLAN ES-4E.
4. INSTALL SINGLE CHANNEL E.V.P.E. DETECTOR UNIT (3M OPTICOM MODEL 711 OR APPROVED EQUAL). CONTRACTOR SHALL FURNISH AND INSTALL E.V.P.E. EQUIPMENT, MOUNTING HARDWARE, CABLE AND ALL OTHER HARDWARE. INSTALL PER DETAIL ON CALTRANS STANDARD PLAN ES-4E.
5. INSTALL POLE MOUNTED RP-3a SIGN PER CALTRANS STANDARD PLAN RS4.

CONSTRUCTION NOTES CONTINUED:



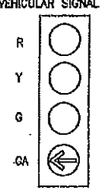


EXISTING PHASE DIAGRAM

FLASHING OPERATION SHALL BE RED IN ALL RED.

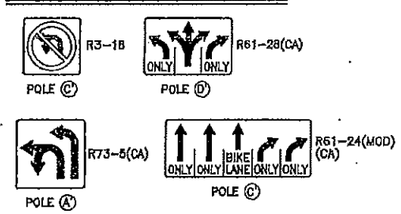
DETAIL "A" [8]

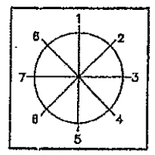
4 SECTION VEHICULAR SIGNAL HEAD



POLE Ⓔ

MAST ARM MOUNTED SIGNS [5]





PUSH BUTTON LOCATION DETAIL

NOT TO SCALE

CONSTRUCTION NOTES CONTINUED:

6. INSTALL MAST ARM MOUNTED SIGN PER DETAIL "U", STANDARD PLAN ES-7N. SIGN TYPE AS NOTED ON PLAN.
7. [redacted]
8. INSTALL 4-SECTION VEHICULAR SIGNAL HEAD. SEE DETAIL "A" THIS SHEET.

SIGNS THIS SHEET

R9-3a

POLES Ⓐ, Ⓑ, Ⓒ & Ⓔ'

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN DIEGO IS CONFINED TO A REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

REGISTERED PROFESSIONAL ENGINEER JOHN P. KEATING 43595 Exp. Dec. 31, 2010 CIVIL STATE OF CALIFORNIA

ENGINEER OF WORK

JOHN P. KEATING R.C.E. 43595 DATE

[redacted] LINSCOTT, LAW & GREENSPAN, ENGINEERS

SIGNAL NO. P9.963

PRIVATE CONTRACT

Traffic Signal Modification Plan for:

CLAIREMONT MESA BOULEVARD and I-15 SOUTHBOUND RAMPS

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 11
SHEET 1a OF 9 SHEETS

PERMIT NUMBER 11-

LOCATION: RTE 15 NB / CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: 5/24/2011

F PAGE

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	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	1	1	7	1	1	CLK RST
1	DONT WALK	1	11	1	1	1	11	1	1	
2	MIN GREEN	1	10	1	5	5	10	1	1	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	0.9	2.0	0.9	2.0	2.0	2.0	0.9	0.9	
6	MAX GAP	0.9	2.0	0.9	2.0	2.0	2.0	0.9	0.9	
7	MIN GAP	0.9	2.0	0.9	2.0	2.0	2.0	0.9	0.9	
8	MAX EXT	9	25	9	30	20	25	9	9	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.0	5.0	3.0	3.6	3.2	5.0	3.0	3.0	MIN
F	RED	0.0	1.0	0.0	2.0	1.0	1.0	0.0	0.0	SEC
	PED XING FT		59				59			
	BIKE XING FT		75				82			

PRE-EMPTION E	
EV SEL	0
RR1 CLR	5
EVA DLY	0
EVA CLR	5
EVB DLY	0
EVB CLR	5
EVC DLY	0
EVC CLR	5
EVD DLY	0
EVD CLR	5
MAX EV	255
RR2 CLR	5

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT	1	2	3	4	5	6	7	8	0
RED LOCK				4	5				1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2				6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES									9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES									D
YEL START UP		2				6			E
FIRST PHASE				4					F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS ARE NOT TO BE CHANGED

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 15 NB / CLAIRMONT MESA BLVD

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C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	80	60	80												LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR	0	0	0										GAPOUT CP1	0	LAG FZ CP 1		2		4		6		8	1
2														GAPOUT CP2	0	LAG FZ CP 2		2		4	5			8	2
3	FZ3 GRN FCTR	0	0	0										GAPOUT CP3	0	LAG FZ CP 3		2		4		6		8	3
4	FZ4 GRN FCTR	35	15	15							PERM TIME			GAPOUT CP4	1	LAG FZ CP 4									4
5	FZ5 GRN FCTR	10	12	25							LAG OFFSET			GAPOUT CP5	1	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	0	LAG FZ CP 6									6
7	FZ7 GRN FCTR	0	0	0							LONG GRN			GAPOUT CP7		LAG FZ CP 7									7
8	FZ8 GRN FCTR	0	0	0							NO GREEN			GAPOUT CP8		LAG FZ CP 8									8
9	MULTI CYCLE	0	0	0										GAPOUT CP9		LAG FZ CP 9									9
A	OFFSET A	40	0	40							OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		2				6			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
RTE 15 RAMP

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1	0	
2		1
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 15 NB / CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: ######## PAGE 3

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1					5				CP 1								
2	CP 2									CP 2				4	5				CP 2								
3	CP 3									CP 3				4	5				CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 15 NB / CLAIRMONT MESA BLVD

CALTRANS C8 Version 3 DATE: ########

7 PAGE

TIME OF DAY ACTIVITY TABLE										
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS										
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0	06	30	1	A		2	3	4	5	6	
1	09	00	2	A	1	2	3	4	5	6	7
2	15	00	3	A		2	3	4	5	6	
3	18	30	E	A	1	2	3	4	5	6	7
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

7	CALIF.				
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	15	R9.7/R12.0	139	191

DISTRICT TRAFFIC ENGINEER — REGISTERED CIVIL ENGINEER NO. 5361

DATE APPROVED May 9, 1983

(11)

POLE SCHEDULE

LOC.	STANDARD TYPE	MASTARM SIG.	MASTARM LUM.	PLACEMENT DIMENSIONS A ft.	PLACEMENT DIMENSIONS B ft.	VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN P.P.B.	REMARKS
(A)	26-4-80	45 [6]	12	STA	5	SV-1-T	(5) - MAT [3] (2) - MAS	SP-1-T	(2) —W→	150 WATT HPS LUMINAIRE
(B)	1-A (7')	—	—	10	5	—	—	TP-1-T	(2) ←W—	
(C)	19-4-80	25	12	STA	5	SV-2-T	MAS	SP-1-T	(6) —W→	150 WATT HPS LUMINAIRE. (INSTALL REMOVABLE CAP ON INBOARD TENON)
(D)	26-4-80	45	12	10	2-1/2	SV-1-T	(4) - MAS (4) - MAS	—	(6) ←W—	150 WATT HPS LUMINAIRE PEU
(E)	1-A (10')	—	—	10	5	TV-1-T [3]	—	SP-1-T		
(F)	PED BARR-ICADE				1-1/2					4 LOCATIONS (ES-6A)
(G)	STATE-FURNISHED CONTROLLER ASSEMBLY (TYPE 170 FOUNDATION, ES-4B).									

CONDUCTOR SCHEDULE

AWG SIZE	PHASE	CIRCUIT	CONDUIT RUN & SIZE 2" (1)	2-1/2" (2)	1-1/2" (3)	2" (4)	2" (5)	1-1/2" (6)	1-1/2" (7)	1-1/2" (8)
14	2	SIGNALS		3						
	4					3	3			
	5			3				3		
	6					3				
	2	PED SIGNALS	2	2						
	4	(F)	2	2		2	2			
	6							2		
	2	PED PUSH BUTTON	1	1						
	4	(F)	1	1		1		1		
	6									
	2,4,(F)	PPB COMMON 6	1	1				1		
	6	PPB COMMON 9				1				
		PHOTOELECTRIC UNIT					3			
		SPARES	3	3		3	3	3		
14										
TOTAL NO. 14			10	16		13	11	10		

			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
10		SIGNAL COMMON		1		1	1			
		LIGHTING		2	2	2	2			
		SPRINKLER CONTROL SERV			2	2	2			
4		LOC. 2 SIGNAL SERVICE			2	2	2			
TYPE B DLC	2	LOOP DLC	2	2						
	4		1	3						
	5		2	2						
	6								1	2
		INTERCONNECT (F)			1	1	1			
	2	EV DLC (F)		1						
	6	EV DLC (F)				1	1			
TOTAL CONDUCTORS/CABLES			15	27	7	22	20	10	1	2

(F) = FUTURE USE.
EV-DLC = SEE "LEGEND" - SHEET E-2.

NOTES-SHEET E-3 ONLY

[1] - SEE "DETAIL - DETECTOR INSTALLATION IN BRIDGE DECK" SHEET E-2.

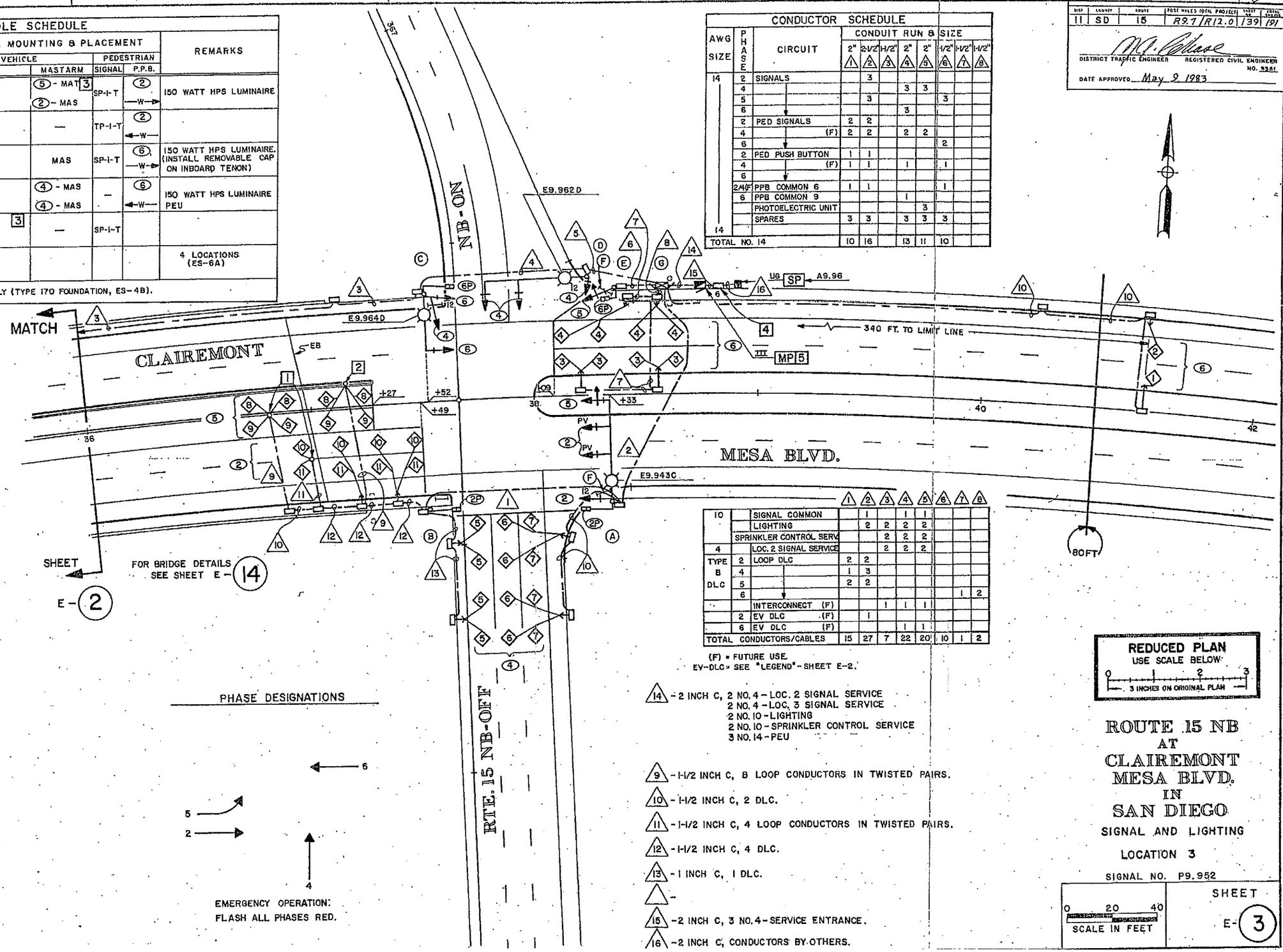
[2] - SEE "SPECIAL DETECTOR HANDHOLE INSTALLATION DETAIL" - ES-5D.

[3] - RED, YELLOW AND GREEN ARROWS.

[4] - SERVICE TERMINATION PULL BOX. BOX PLACEMENT AND IDENTIFICATION TAGS ACCORDING TO RULES OF SERVING UTILITY.

[5] - SEE [MP-1] WIRING DIAGRAM, SHEET E-1. CIRCUIT BREAKER "B" SHALL BE 40 AMP, 1 POLE - LOCATION 2 SIGNAL SERVICE.

[6] - DETAIL "U", ES-6T REQUIRED. TENONS AT 12' & 24'.



(14) - 2 INCH C, 2 NO. 4 - LOC. 2 SIGNAL SERVICE
2 NO. 4 - LOC. 3 SIGNAL SERVICE
2 NO. 10 - LIGHTING
2 NO. 10 - SPRINKLER CONTROL SERVICE
3 NO. 14 - PEU

(9) - 1-1/2 INCH C, 8 LOOP CONDUCTORS IN TWISTED PAIRS.

(10) - 1-1/2 INCH C, 2 DLC.

(11) - 1-1/2 INCH C, 4 LOOP CONDUCTORS IN TWISTED PAIRS.

(12) - 1-1/2 INCH C, 4 DLC.

(13) - 1 INCH C, 1 DLC.

( ) -

(15) - 2 INCH C, 3 NO. 4 - SERVICE ENTRANCE.

(16) - 2 INCH C, CONDUCTORS BY OTHERS.

REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

ROUTE 15 NB AT CLAIREMONT MESA BLVD. IN SAN DIEGO

SIGNAL AND LIGHTING

LOCATION 3

SIGNAL NO. P9.952

0 20 40
SCALE IN FEET

SHEET E-3

INTERSECTION: Lightwave Av & Overland Av

22 Program

Group Assignment:
Field Master Assignment: None

N/S Street Name: Overland Av
E/W Street Name: Lightwave Av

Last Change:
Timing Sheet By: JMV
Approved By:

Drawing Number: 29738-42-D
System Ref. Number:
Timing implemented on:

12

Row	Column # --->	1	2	3	4	5	6	7	8
		Lightwave		Overland		Lightwave		Overland	
	Phase # --->	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		7
1	Ped FDW		20		19		20		19
2	Min Green	4	7	4	7	4	7	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.3	2.0	3.3	2.0	3.3	2.0	3.3
6	Max Gap	2.0	3.3	2.0	3.3	2.0	3.3	2.0	3.3
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	60	30	60	30	60
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		1.0		1.0		1.0		1.0
E	Yellow	①3.4 ~~3.0~~	①3.9 ~~3.6~~	①3.4 ~~3.0~~	①3.9 ~~3.6~~	①3.4 ~~3.0~~	①3.9 ~~3.6~~	①3.4 ~~3.0~~	①3.9 ~~3.6~~
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1 <F Page>
F + Phase + Row

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	2468
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2___6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	___4___8

Phase Functions <F Page>
F + F + Row

①JMI
12/29/01

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	14	C + 0 + 0
Zone Number	14	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	111	C + 0 + 3
QuicNet Channel	D16133	(QuicNet)

Communication Addresses

Row		9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
A	Overlap A				
B	Overlap B				
C	Overlap C				
D	Overlap D				

Overlap Timing <F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset 0
= Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O

	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Downtime Flash	~~60~~ 255	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	234

Disable Communications Ports
D + D + 9

12

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Rod Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	_____6__
7	Ped 4P	___4____
8	Ped 8P	_____8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5___
B	EV-B Phases	___4__7_
C	EV-C Phases	1____6__
D	EV-D Phases	__3____8
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

(This parameter is NOT downloaded)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

12

Row	1 Delay	3 Carry-over	Detector Name	332 Input File	Detector Number
0				1I1	14
1		1.8		2I2U	1
2		1.8		2I2L	5
3				2I3U	21
4				2I3L	25
5				2I4	9
6				3I5	16
7		1.8		4I6U	3
8				4I6L	7
9	10.0			4I7U	23
A				4I7L	27
B				4I8	11
C				1I9U	18
D				3I9L	20
E		---	---	---	---
F	---	---	---	---	---

Row	2 Delay	4 Carry-over	Detector Name	332 Input File	Detector Number
0				5J1	13
1		1.8		6J2U	2
2		1.8		6J2L	6
3				6J3U	22
4				6J3L	26
5				6J4	10
6				7J5	15
7		1.8		8J6U	4
8				8J6L	8
9	10.0			8J7U	24
A				8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

(These parameters are NOT downloaded.)

LOCATION: RTE 52 WB @ KEARNY VILLA ROAD

CALTRANS C8 Version 3 DATE: 6/1/2011 PAGE 1

F PAGE

13

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
0	WALK	1	1	1	1	1	1	1	1	CLK RST	EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
1	DONT WALK	1	1	1	1	1	1	1	1		RR1 CLR	5	RED LOCK				4					1
2	MIN GREEN	1	10	1	5	5	10	1	1		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	0.9	2.0	0.9	1.0	1.0	2.0	0.9	0.9		EVB CLR	5	PED PHASES									5
6	MAX GAP	0.9	2.0	0.9	1.0	1.0	2.0	0.9	0.9		EVC DLY	0	RT OLA									6
7	MIN GAP	0.9	2.0	0.9	1.0	1.0	2.0	0.9	0.9		EVC CLR	5	RT OLB									7
8	MAX EXT	9	35	9	20	30	35	9	9		EVD DLY	0	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	5	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	5	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.0	4.7	3.0	3.6	3.2	4.7	3.0	3.0	MIN			YEL START UP		2				6			E
F	RED	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0	SEC			FIRST PHASE				4					F
	PED XING FT													1	2	3	4	5	6	7	8	
	BIKE XING FT		60				103															

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5
FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0
FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1
CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

NOTES:

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 52 WB @ KEARNY VILLA ROAD

CALTRANS C8 Version 3 DATE: 2/21/2006 13

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS								
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
RTE 52 EB RAMP

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		
2		1
3		
4		
5		
6		
7		
8		

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 52 WB @ KEARNY VILLA ROAD

CALTRANS C8 Version 3 DATE: 2/21/2006 PAGE 3

13

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS						
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7
0	RCL									RCL									RCL							
1	CP 1									CP 1									CP 1							
2	CP 2									CP 2									CP 2							
3	CP 3									CP 3									CP 3							
4	CP 4									CP 4									CP 4							
5	CP 5									CP 5									CP 5							
6	CP 6									CP 6									CP 6							
7	CP 7									CP 7									CP 7							
8	CP 8									CP 8									CP 8							
9	CP 9									CP 9									CP 9							
A																			RCL 1							
B																			RCL 2							
C																										
D																										
E																										
F																										
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE	1	1							4
5										2 PED	1	2							5
6										6 PED	1	1				6			6
7										4 PED	1	1		4					7
8										8 PED	1	1						8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: **RTE 52 WB @ KEARNY VILLA ROAD**

CALTRANS C8 Version 3 DATE: 2/21/2006

13

7 PAGE

TIME OF DAY ACTIVITY TABLE										
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS										
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

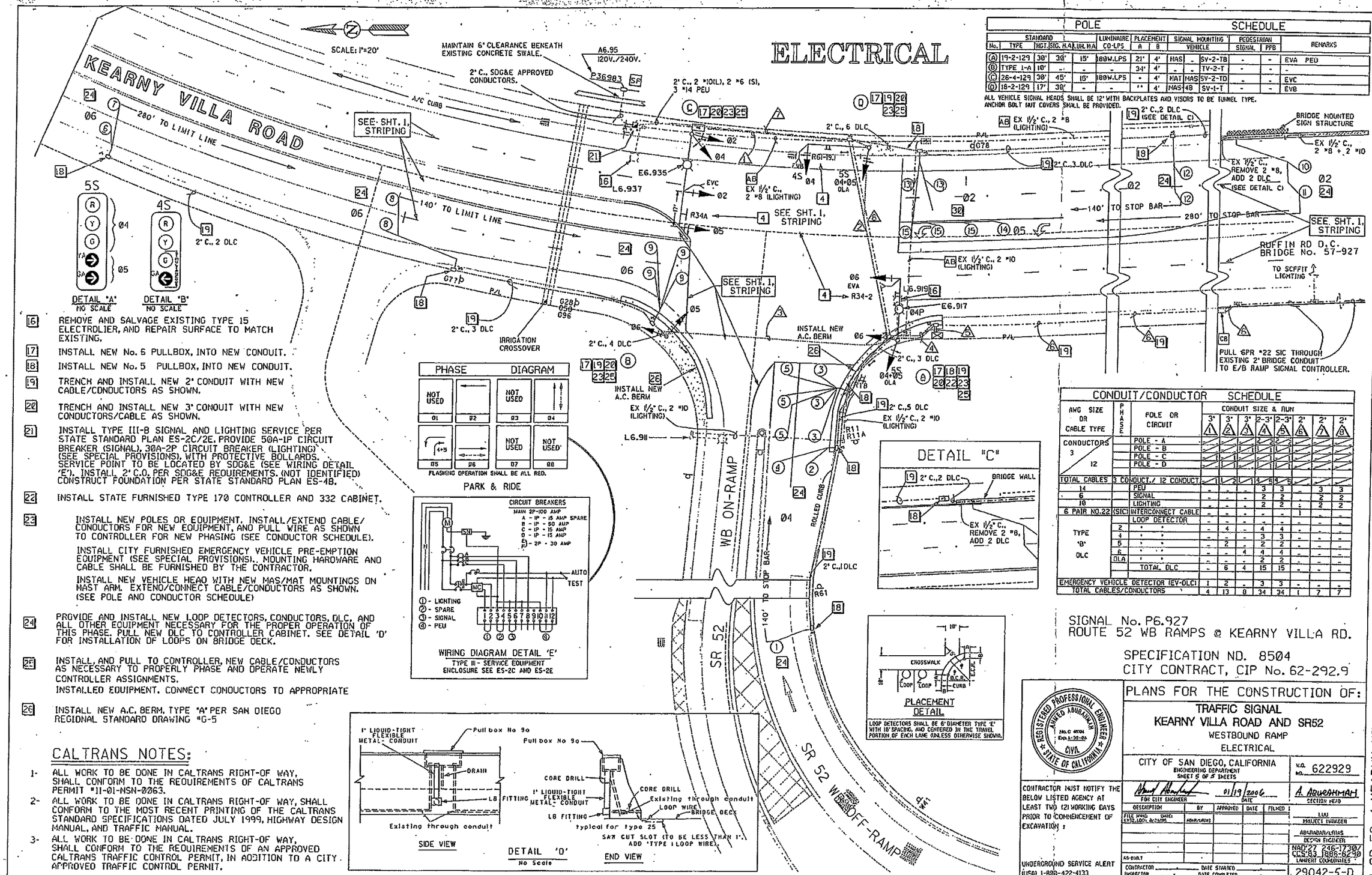
1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

ELECTRICAL



POLE SCHEDULE												
STANDARD				LUMINAIRE	PLACEMENT		SIGNAL MOUNTING			PEDESTRIAN		REMARKS
No.	TYPE	HGT.	SIG. H.A.	UNI. H.A.	CO-LPS	A	B	VEHICLE			SIGNAL	PPB	
(A)	19-2-129	30'	36'	15'	180W.LPS	21'	4'	HAS	-	SV-2-TB	-	-	EVA PED
(B)	TYPE 1-A	10'	-	-	-	3-1'	4'	-	-	TV-2-T	-	-	-
(C)	26-4-129	30'	45'	15'	180W.LPS	*	4'	MAT	HAS	SV-2-TD	-	-	EVC
(D)	18-2-129	17'	39'	-	-	**	4'	HAS	48	SV-1-T	-	-	EVB

ALL VEHICLE SIGNAL HEADS SHALL BE 12" WITH BACKPLATES AND VISORS TO BE TUNNEL TYPE.
ANCHOR BOLT NUT COVERS SHALL BE PROVIDED.

CONDUIT/CONDUCTOR SCHEDULE										
AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE & RUN							
			3" (1)	3" (2)	3" (4)	2-3" (5)	2-3" (6)	2" (3)	2" (7)	2" (8)
CONDUCTORS 3 12		POLE - A	-	-	-	2	2	-	-	-
		POLE - B	-	-	-	1	1	-	-	-
		POLE - C	-	-	-	1	1	-	-	-
		POLE - D	-	-	-	1	1	-	-	-
TOTAL CABLES	3	CONDUCT./ 12 CONDUCT.	-	1	2	14	5/4	5	-	-
14		PEU	-	-	-	3	3	-	3	3
6		SIGNAL	-	-	-	2	2	-	2	2
10		LIGHTING	-	-	-	2	2	-	2	2
6 PAIR NO.22	(SIC)	INTERCONNECT CABLE	-	-	-	-	-	1	-	-
		LOOP DETECTOR	-	-	-	-	-	-	-	-
TYPE 'B' DLC	2	" "	-	4	-	4	4	-	-	-
	4	" "	-	-	-	3	3	-	-	-
	5	" "	-	2	-	2	2	-	-	-
	6	" "	-	-	4	4	4	-	-	-
	DLA	" "	-	-	-	2	2	-	-	-
		TOTAL DLC	-	6	4	15	15	-	-	-
EMERGENCY VEHICLE DETECTOR (EV-DLC)			1	2	-	3	3	-	-	-
TOTAL CABLES/CONDUCTORS			4	13	8	34	34	1	7	7

16 REMOVE AND SALVAGE EXISTING TYPE 15 ELECTROLIER, AND REPAIR SURFACE TO MATCH EXISTING.

17 INSTALL NEW No. 6 PULLBOX, INTO NEW CONDUIT.

18 INSTALL NEW No. 5 PULLBOX, INTO NEW CONDUIT.

19 TRENCH AND INSTALL NEW 2" CONDUIT WITH NEW CABLE/CONDUCTORS AS SHOWN.

20 TRENCH AND INSTALL NEW 3" CONDUIT WITH NEW CONDUCTORS/CABLE AS SHOWN.

21 INSTALL TYPE III-B SIGNAL AND LIGHTING SERVICE PER STATE STANDARD PLAN ES-2C/2E. PROVIDE 50A-1P CIRCUIT BREAKER (SIGNAL), 30A-2P CIRCUIT BREAKER (LIGHTING) (SEE SPECIAL PROVISIONS), WITH PROTECTIVE BOLLARDS. SERVICE POINT TO BE LOCATED BY SDG&E (SEE WIRING DETAIL 'E'). INSTALL 2" C.O. PER SDG&E REQUIREMENTS. (NOT IDENTIFIED) CONSTRUCT FOUNDATION PER STATE STANDARD PLAN ES-4B.

22 INSTALL STATE FURNISHED TYPE 170 CONTROLLER AND 332 CABINET.

23 INSTALL NEW POLES OR EQUIPMENT. INSTALL/EXTEND CABLE/CONDUCTORS FOR NEW EQUIPMENT, AND PULL WIRE AS SHOWN TO CONTROLLER FOR NEW PHASING (SEE CONDUCTOR SCHEDULE).

INSTALL CITY FURNISHED EMERGENCY VEHICLE PRE-EMPTION EQUIPMENT (SEE SPECIAL PROVISIONS). MOUNTING HARDWARE AND CABLE SHALL BE FURNISHED BY THE CONTRACTOR.

INSTALL NEW VEHICLE HEAD WITH NEW MAS/MAT MOUNTINGS ON MAST ARM. EXTEND/CONNECT CABLE/CONDUCTORS AS SHOWN. (SEE POLE AND CONDUCTOR SCHEDULE)

24 PROVIDE AND INSTALL NEW LOOP DETECTORS, CONDUCTORS, DLC, AND ALL OTHER EQUIPMENT NECESSARY FOR THE PROPER OPERATION OF THIS PHASE. PULL NEW DLC TO CONTROLLER CABINET. SEE DETAIL 'D' FOR INSTALLATION OF LOOPS ON BRIDGE DECK.

25 INSTALL, AND PULL TO CONTROLLER, NEW CABLE/CONDUCTORS AS NECESSARY TO PROPERLY PHASE AND OPERATE NEWLY CONTROLLER ASSIGNMENTS.
INSTALLED EQUIPMENT. CONNECT CONDUCTORS TO APPROPRIATE

26 INSTALL NEW A.C. BERM, TYPE "A" PER SAN DIEGO REGIONAL STANDARD DRAWING #G-5

CALTRANS NOTES:

1- ALL WORK TO BE DONE IN CALTRANS RIGHT-OF WAY, SHALL CONFORM TO THE REQUIREMENTS OF CALTRANS PERMIT #11-01-NSN-0063.

2- ALL WORK TO BE DONE IN CALTRANS RIGHT-OF WAY, SHALL CONFORM TO THE MOST RECENT PRINTING OF THE CALTRANS STANDARD SPECIFICATIONS DATED JULY 1999, HIGHWAY DESIGN MANUAL, AND TRAFFIC MANUAL.

3- ALL WORK TO BE DONE IN CALTRANS RIGHT-OF WAY, SHALL CONFORM TO THE REQUIREMENTS OF AN APPROVED CALTRANS TRAFFIC CONTROL PERMIT, IN ADDITION TO A CITY APPROVED TRAFFIC CONTROL PERMIT.

SIGNAL No. P6.927
ROUTE 52 WB RAMPS @ KEARNY VILLA RD.

SPECIFICATION NO. 8504
CITY CONTRACT, CIP No. 62-292.9

REGISTERED PROFESSIONAL ENGINEER — AHMED ABURAHMAH — No. C 48094 — Exp. 6-30-06 — CIVIL — STATE OF CALIFORNIA

PLANS FOR THE CONSTRUCTION OF:

TRAFFIC SIGNAL
KEARNY VILLA ROAD AND SR52
WESTBOUND RAMP
ELECTRICAL

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 8 OF 8 SHEETS

W.O. NO. 622929

CONTRACTOR MUST NOTIFY THE BELOW LISTED AGENCY AT LEAST TWO (2) WORKING DAYS PRIOR TO COMMENCEMENT OF EXCAVATION :

UNDERGROUND SERVICE ALERT (USA) 1-800-422-4133

01/19/2006
FOR CITY ENGINEER — DATE

A. ABURAHMAH — SECTION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
FILE MADE 6/22/2005	ABURAHMAH			

LUU — PROJECT ENGINEER
ABURAHMAH/MIAS — DESIGN ENGINEER
AS-BUILT
CONTRACTOR _____ DATE STARTED _____
INSPECTOR _____ DATE COMPLETED _____

NAD/27 246-17307
CCS83 1886-52-30
LAMBERT COORDINATES

29042-5-D

11-SD-52 / KEARNY VILLA RD @ SR52 W/B RAMPS/ PM 6.92 / PERMIT 11-01-NSN0063

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

(13)

LOCATION: RTE 52 EB @ KEARNY VILLA ROAD

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F PAGE

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
0	WALK	1	1	1	1	1	1	1	1	CLK RST	EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
1	DONT WALK	1	1	1	1	1	1	1	1		RR1 CLR	5	RED LOCK	1			4					1
2	MIN GREEN	5	10	1	5	5	10	1	1		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	2.0	2.0	0.9	1.0	1.0	2.0	0.9	0.9		EVB CLR	5	PED PHASES									5
6	MAX GAP	2.0	2.0	0.9	1.0	1.0	2.0	0.9	0.9		EVC DLY	0	RT OLA									6
7	MIN GAP	2.0	2.0	0.9	1.0	1.0	2.0	0.9	0.9		EVC CLR	5	RT OLB									7
8	MAX EXT	20	30	9	20	30	30	9	9		EVD DLY	0	DBL ENTRY									8
9	MAX 2		45							YR	EVD CLR	5	MAX 2 PHASES		2							9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	5	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.2	4.7	3.0	3.6	3.2	4.7	3.0	3.0	MIN			YEL START UP		2				6			E
F	RED	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0	SEC			FIRST PHASE				4					F
	PED XING FT													1	2	3	4	5	6	7	8	
	BIKE XING FT		104				78															

NOTES:

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5
FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0
FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1
CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: RTE 52 EB @ KEARNY VILLA ROAD

CALTRANS C8 DATE: 12/26/96 PAGE 2

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAG									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		X		X		X		X	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		X				X			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRP																							F

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER :
RTE 52 EB RAMP

LOCATION	OFF	ON
1		X
2	X	
3	X	
4	X	
5	X	
6	X	
7	X	
8	X	

COO = 1

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 52 EB @ KEARNY VILLA ROAD

CALTRANS C8 DATE 12/26/96 PAGE 3

14

D PAGE

	D.	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		X							5
6										6 PED						X			6
7										4 PED				X					7
8										8 PED								X	8
9																			9
A	OLA NOT						X			OLA ON				X	X				A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: RTE 52 EB @ KEARNY VILLA ROAD

CALTRANS C8 DATE : 12/26/96 PAGE 4

14

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2	15	00	2	X		X	X	X	X	X	X
3	19	00	2			X	X	X	X	X	X
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION

2 MAX 2

3 MAX 3

4 COND SERV (1ST SELECT)

5 COND SERV (2ND SELECT)

6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)

A TRAFFIC ACT. MAX 2 OPERATION

B TIME OF DAY MAX RECALL (2ND SELECT)

C YELLOW YIELD COORDINATION

D YELLOW YIELD COORDINATION

E TIME OF DAY FREE OPERATION

F FLASHING OPERATION

(14)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	52	6.7	6	8

Thomas J Ramos
REGISTERED ELECT ENGINEER
5-7-96
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER T. J. RAMOS No. 14915 Exp. 6/30/99 ELECTRICAL STATE OF CALIFORNIA

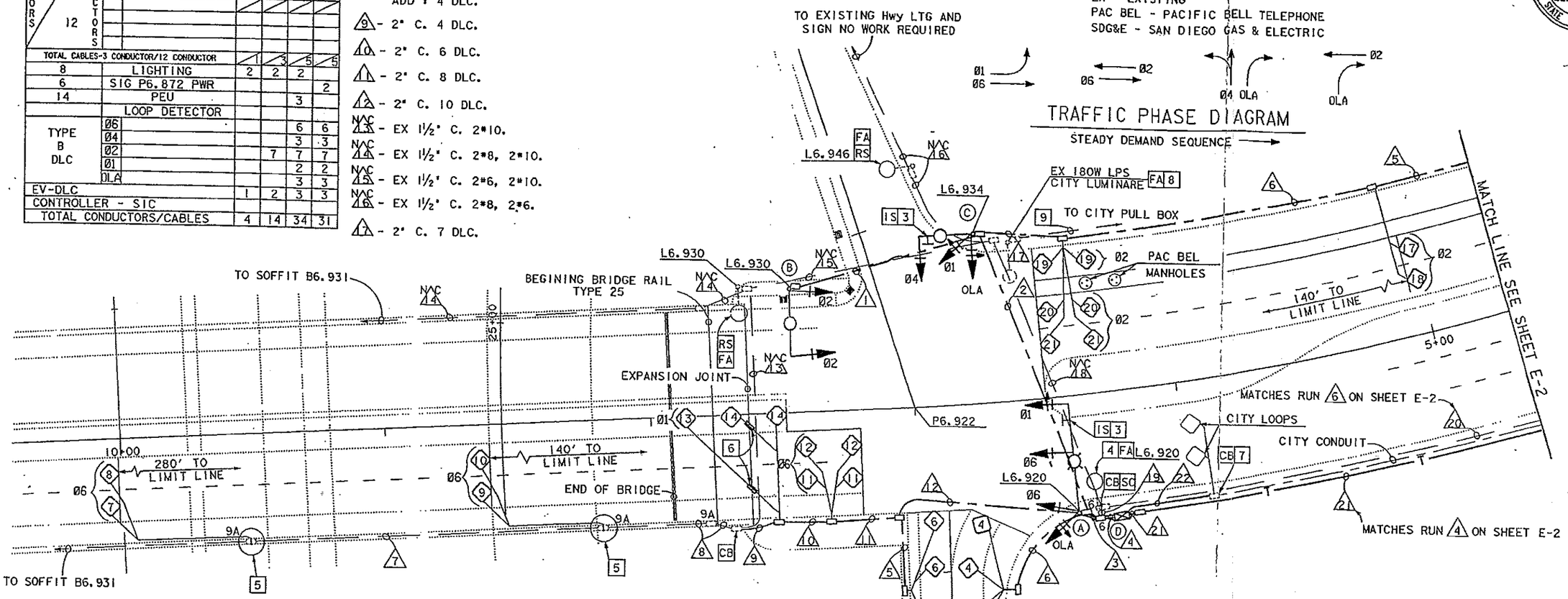
AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	CONDUIT SIZE/RUN 3" (1)	3" (2)	2-3" (3)	2-3" (4)
NO. 14 CABLES		POLE - A			2	2
3 CONDUCTORS		B	1	1	1	1
		C		2	2	2
12 CONDUCTORS						
TOTAL CABLES-3 CONDUCTOR/12 CONDUCTOR			1	3	5	5
8		LIGHTING	2	2	2	
6		SIG P6.872 PWR				2
14		PEU			3	
		LOOP DETECTOR				
TYPE B DLC	Ø6				6	6
	Ø4				3	3
	Ø2			7	7	7
	Ø1				2	2
	OLA				3	3
EV-DLC			1	2	3	3
CONTROLLER - SIC						
TOTAL CONDUCTORS/CABLES			4	14	34	31

CONDUIT NOTES (TSO)

(5) - 2" C. 2 DLC.
(6) - 2" C. 4 DLC.
(7) - EX 1½" C. 2*10 (LTG), ADD : 2 DLC.
(8) - EX 1½" C. 2*10, ADD : 4 DLC.
(9) - 2" C. 4 DLC.
(10) - 2" C. 6 DLC.
(11) - 2" C. 8 DLC.
(12) - 2" C. 10 DLC.
NYC (13) - EX 1½" C. 2*10.
NYC (14) - EX 1½" C. 2*8, 2*10.
NYC (15) - EX 1½" C. 2*6, 2*10.
NYC (16) - EX 1½" C. 2*8, 2*6.
(17) - 2" C. 7 DLC.
NYC (18) - EX 1½" C. 2*4, 2*6.
(19) - 2" C. 2*8 (LTG), 2*6 (SIG PWR), 3*14 (PEU).
(20) - EX 2" C. WITH: 2*4, 2*6, 3*14. ADD: 2*6 (SIG PWR)
(21) - 2" C. 1 SIC (TELEPHONE).
(22) - 2" C. 1 SIC (USE EXISTING COILED SIC, SEE NOTE [7]).

LEGEND

LTG - LIGHTING
TSO - THIS SHEET ONLY
SIG PWR - SIGNAL POWER
EX - EXISTING
PAC BEL - PACIFIC BELL TELEPHONE
SDG&E - SAN DIEGO GAS & ELECTRIC



POLE SCHEDULE										
LOC	STANDARD TYPE	MASTARM SIG	MASTARM LUM	PLACEMENT DIMENSIONS A FT	PLACEMENT DIMENSIONS B FT	SIGNAL MOUNTING AND PLACEMENT VEHICLE [1] POLE	VEHICLE [1] MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
(A)	26-4-80	40'	12'	8	4	SV-2-T	Ø1-MAT Ø6-MAS [2]	-	-	180W LPS RELOCATED PEU
(B)	19-2-80	25'	12'	18	7	SV-1-T	Ø2-MAS [2]	-	-	180W LPS
(C)	17-2-80	20'	12'	8	6	SV-2-T	Ø4-MAS [2]	-	-	180W LPS
(D)	INSTALL STATE-FURNISHED MODEL 170 CONTROLLER ASSEMBLY (TYPE 332 CABINET). SEE ES-4B FOR FOUNDATION DETAILS.									

NOTES TSO

1. ALL SIGNAL HEADS SHALL BE 12". ALL VISORS SHALL BE TUNNEL TYPE.
2. TERMINATE EV-DLC IN MAS SIGNAL HEAD, RED SECTION. LEAVE ONE FOOT OF SLACK.
3. DETAIL 'U', ES-6T REQUIRED.
4. RS TYPE 15 RL PEU. SEE DETAIL 'B' ON SHEET E-2.
5. SEE DETAIL 'A' ON SHEET E-2.
6. SEE LOOP LEAD-IN DETAIL ES-5E.
7. PULL EXISTING SIC INTO CONTROLLER CABINET, COIL 6' ON BOTTOM OF CABINET.
8. RS TO CITY SALVAGE YARD AT 20TH & B St.
9. AB CONDUCTORS.

SIGNAL AND LIGHTING

KEARNY VILLA ROAD AND EAST BOUND OFF RAMP

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
TRAFFIC ELECTRICAL
PROJECT ENGINEER T J RAMOS
CALCULATED/DESIGNED BY TJR
CHECKED BY
DATE 10/95
REVISED BY
DATE REVISED

(15)

Ruffin Rd. Kearny Villa Rd. Kearny Villa Rd.

200 SA 1.e

PHASE TIMING

INTERVAL		1	2	3	4	5	6	7	8
WALK	0		7		7		7		
FLASH D/W	1		13		22		15		
MIN GREEN	2	4	10	4	7	4	10		
TYPE 3 DET	3								
ADD PER VEH	4								
VEH EXTN *	5	2.0	3.5	2.0	2.6	2.0	3.6		
MAX GAP *	6	2.0	3.5	2.0	2.6	2.0	3.6		
MIN GAP *	7	2.0	0.2	2.0	0.2	2.0	0.2		
MAX EXTN	8	30	60	30	40	30	60		
MAX 2	9								
BUS LEAD	A								
CALL TO PHS	B								
REDUCE BY	C		0.1		0.1		0.1		
EVERY	D		0.9		1.2	4.8	0.9		
YELLOW	E	3.0	~~5.0~~ 4.0	3.0	~~4.0~~	3.0	~~5.0~~ 4.6		
RED CLEAR	F	1.0	1.0	1.0	1.0	1.0	1.0		

F + PHASE + LOCATION MM 11/25/98

PREEMPT	E	
RR 1 DELAY		0
RR 1 CLEAR		1
EVA DELAY		2
EVA CLEAR	3	3
EVB DELAY		4
EVB CLEAR	3	5
EVC DELAY		6
EVC CLEAR	3	7
EVD DELAY		8
EVD CLEAR	3	9
RR2 DELAY		A
RR 2 CLEAR		B
EV CLR TMR		C
EV DLY TMR		D
RR CLR TMR		E
RR DLY TMR		F

* Must be the same for non-density operation

MAX INITIAL (F-0-E) 0 RED REVERT (F-0-F) 5.0 ALL-RED START (F-C-0) 0.0

PHASE FUNCTION FLAGS

		PHASE 1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X		
RED LOCK	1								
YELLOW LOCK	2								
VEHICLE RECALL	3								
PED RECALL	4								
PEDS (VIEW)	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A		X				X		
MAX 2	B								
COND SERVICE	C								
	D								
START-UP	E		X				X		
FIRST PHASES	F			X					

F + F + FUNCTION #

OVERLAP TIMING

	LOAD SWITCH		GREEN 9	YELLOW C	RED D
		OLAP A			
		OLAP B			
		OLAP C			
		OLAP D			

D + 0 + OVERLAP

F + COLOR + OVERLAP

PHASE SEQUENCE

	PHASE 1	2	3	4	5	6	7	8
LAG 0 (FREE)		X		X		X		

C + F + 0

MANUAL (C-A-1) 14

ADDRESS (C-0-0)

TURN-ON DATE: 04-11-1996

TIME: 10:45

DRAWING NO. D- 27656-8

LAST CHANGE: 04-12-1996

BY: VAC DRH

LOCATION Kearny Villa Road & Ruffin Road

DETECTOR TIMES

Y \ X	SET DELAY 1	SET DELAY 2	SET CARRY 3	SET CARRY 4	OBS COUNT 5	OBS COUNT 6	OBS DELAY 7	OBS DELAY 8	OBS CARRY 9	OBS CARRY A
0	1I1	5J1	1I1	5J1	1I1	5J1	1I1	5J1	1I1	5J1
1	2I2U	6J2U	2I2U 1.8	6J2U 1.8	2I2U	6J2U	2I2U	6J2U	2I2U	6J2U
2	2I2L	6J2L	2I2L 1.8	6J2L	2I2L	6J2L	2I2L	6J2L	2I2L	6J2L
3	2I3U	6J3U	2I3U	6J3U	2I3U	6J3U	2I3U	6J3U	2I3U	6J3U
4	2I3L	6J3L	2I3L	6J3L	2I3L	6J3L	2I3L	6J3L	2I3L	6J3L
5	2I4	6J4	2I4	6J4	2I4	6J4	2I4	6J4	2I4	6J4
6	3I5	7J5	3I5	7J5	3I5	7J5	3I5	7J5	3I5	7J5
7	4I6U	8J6U	4I6U 1.8	8J6U	4I6U	8J6U	4I6U	8J6U	4I6U	8J6U
8	4I6L	8J6L	4I6L 1.8	8J6L	4I6L	8J6L	4I6L	8J6L	4I6L	8J6L
9	4I7U	8J7U	4I7U	8J7U	4I7U	8J7U	4I7U	8J7U	4I7U	8J7U
A	4I7L 10.	8J7L	4I7L	8J7L	4I7L	8J7L	4I7L	8J7L	4I7L	8J7L
B	4I8	8J8	4I8	8J8	4I8	8J8	4I8	8J8	4I8	8J8
C	1I9U	5J9U	1I9U	5J9U	1I9U	5J9U	1I9U	5J9U	1I9U	5J9U
D	3I9L	7J9L	3I9L	7J9L	3I9L	7J9L	3I9L	7J9L	3I9L	7J9L

D + X (ACROSS) + Y (DOWN)

TO ACCESS CONFIGURATION DATA, SET F-9-E = 1

TIME OF DAY FEATURES

EVENT	TIME	FUNC	DAY OF WEEK S 1	M 2	T 3	W 4	T 5	F 6	S 7
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									

7 + EVENT #

PHASE OR FUNCTION

1	2	3	4	5	6	7	8

D + F + EVENT

TIME OF DAY FUNCTION CODES

0-NONE
1-TOD LOCK
2-YELLOW LOCK
3-NTH RECALL
4-PED RECALL
5-RR PREMPT
6-SPT NO WALK
7-TOD RESET
8-CNL ENTRY
9-NTH MAX RCL
A-SPT 1 RCL
B-MAX 2 ERT
C-GND SERV
D-TOD LAG PHS

E-1 VOL OVERRIDE
F-PHASE BANK 2
G-PHASE BANK 1
H-SPT COUNT
I-SPLIT MONITOR

F - TOD OUTPUTS
1- TOD OUTPUT 1
2- TOD OUTPUT 2
3- TOD OUTPUT 3
4- TOD OUTPUT 4

TIME AND DATE

8 - 0 HOUR, MINUTE, DAY-OF-WEEK
8 - 1 DAY-OF-MONTH, YEAR, MONTH
8 - F SECONDS

CONFIGURATION DATA

		PHASE 1	2	3	4	5	6	7	8
EXCLUSIVE	0								
RR1 GN CLR	1								
RR2 GRN CLR	2								
RR2 LTD SRV	3								
PRO/PERM	4								
OLA GN OMIT	5								
OLB GN OMIT	6								
OLC GN OMIT	7								
OLD GN OMIT	8								
OV FL YELLOW	9								
EMVEH A	A		X			X			
EMVEH B	B				X				
EMVEH C	C	X					X		
EMVEH D	D			X					
EXTRA	E	X		X	X				
IC SELECT	F		X						

E + E + INTERVAL

EXTRA (E+E+E)
1-TBC TYPE 1
2-NEMA COORD
3-DAVLIGHT SAVINGS
4-EV ADVANCE
5-REMOTE EVP
6-SPECIAL EVENT
7-PRETIMED
8-SPLIT RING

ICSELECT (E+E+F)
1-SIMPLEX IN
2-2 WAY MODEM
3-7 WIRE IN
4-FLH/FREE
5-SIMPLEX OUT
6-7 WIRE OUT

ASSIGN5 (E+F+F)
1-RT OVERLAP
2-TOD OUTPUTS
3-STEADY EV BEACON
4-FLASH EV BEACON

CONFIGURATION DATA

		PHASE 1	2	3	4	5	6	7	8
	0								
RR OLAP A	1								
RR OLAP B	2								
RR OLAP C	3								
RR OLAP D	4								
PED 2P	5		X						
PED 6P	6						X		
PED 4P	7				X				
PED 8P	8								
FLH YELLOW	9								
OVERLAP A	A								
OVERLAP B	B								
OVERLAP C	C								
OVERLAP D	D								
RESTRICT	E								
ASSIGN5	F								

E + F + INTERVAL

LOCATION	Kearny Villa Road	&	Ruffin Road

INTERSECTION: CHESAPEAKE DR & RUFFIN RD

223 Program

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Group Assignment:
Field Master Assignment:

N/S Street Name: RUFFIN RD
E/W Street Name: CHESAPEAKE DR

Last Database Change:
System Ref. Number:

Row	Column # --->	1	2	3	4	5	6	7	8
		Phase							
		RUFFIN RD			CHESAPEAKE DR		RUFFIN RD		CHESAPEAKE DR
	Phase # --->	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		7
1	Ped FDW		13		23		13		24
2	Min Green	4	10		6	4	10		6
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	4.3		2.0	2.0	4.2		2.0
6	Max Gap	2.0	4.3		2.0	2.0	4.2		2.0
7	Min Gap	2.0	0.2		2.0	2.0	0.2		2.0
8	Max Limit	30	60		40	30	60		40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		0.7				0.8		
E	Yellow	3.4	4.3		4.5	3.4	4.3		3.9
F	Red Clear	1.0	1.0		1.0	1.0	1.0		1.0

Phase Timing - Bank 1
F + Phase + Row

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12_456_8
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2___6__
4	Ped Recall	
5	Peds (View)	_2_4_6_8
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	___4___8
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	___4___8

Phase Functions <F Page>
F + F + Row

Max Initial	0
Red Revert	5.0
All Red Start	0.0

F + 0 + E
F + 0 + F
F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O

	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	_234___

Disable Communication Ports
D + D + 9

Timing Sheet By: JM1
Approved By: EFF
Drawing Number: 25614-D
Timing Implemented On: 8/2/10

INTERSECTION: CHESAPEAKE DR & RUFFIN RD

223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function 7 + ROW

<D Page> D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration E + F + ROW

<E Page>

Day of Week
1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4
C	EV-C Phases	1 6
D	EV-D Phases	8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

For access, set F + 9 + E = 1

Configuration E + E + ROW

Time and Date
8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

INTERSECTION: CHESAPEAKE DR & RUFFIN RD

223 Program

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8	10.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8	10.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234____
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	____5678
E	-- -- -- -- -- -- -- --	1234____
F	-- 25 26 27 28 -- -- --	_2345___

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	
2	System Det. # 2	
3	System Det. # 3	
4	System Det. # 4	
5	System Det. # 5	
6	System Det. # 6	
7	System Det. # 7	
8	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: HAZARD WY & RUFFIN RD

233 Program

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S Street: Ruffin Rd
E/W Street: Hazard Wy

Last Database Change:

Timing sheets by: REJ
Approved by: BC
Timing implemented on: 1/5/2010

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Row	Phase Numbers—>	1	2	3	4	5	6	7	8
		Ruffin Rd	Pvt Dy	Hazard Wy			Ruffin Rd		
0	Ped Walk		7		7		7		
1	Ped FDW		10		19		13		
2	Min Green	4	10	7	7	4	10		
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	5.7	2.0	2.0	2.0	5.7		
6	Max Gap	2.0	5.7	2.0	2.0	2.0	5.7		
7	Min Gap	2.0	0.2	2.0	2.0	2.0	0.2		
8	Max Limit	30	60	40	40	30	60		
9	Max Limit 2								
A	Adv. / Delay Walk								
B	PE Min Ped FDW								
C	Cond Serv Check								
D	Reduce Every		0.5				0.5		
E	Yellow Change	3.4	4.3	3.9	3.9	3.4	4.3		
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0		

Phase Timing - Bank 1 <F/1+Phase+Row>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	- - -
View EV Clear	- - -
View RR Delay	- - -
View RR Clear	- - -

Preempt Timing <F/1+E+Row>

	F	Row
Permit	123456__	0
Red Lock		1
Yellow Lock		2
Min Recall		3
Ped Recall		4
View Set Peds		5
Rest In Walk		6
Red Rest		7
Double Entry		8
Max Recall		9
Soft Recall	_2___6__	A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	_2___6__	E
First Phases	__3_____	F

Phase Functions <F/1+F+Row>

Current Calculated Cycle Length: C/0 + B + F

	9	A	B	C	D
	- - -	- - -	- - -	- - -	- - -
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

Drop Number	18	<C/0+0+0>
Zone Number	18	<C/0+0+1>
Area Number	5	<C/0+0+2>
Area Address	117	<C/0+0+3>
QuicNet Channel	COM37	(QuicNet)

Communication Addresses

(Outputs specified in Assignable Outputs at E/127+A+E & F)

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Notes:

Free Lag	_2_4_6__	<C/1+F+0>

How to Set Page Access Code:
F/1 – C + 0 + F = 1

INTERSECTION: HAZARD WY & RUFFIN RD

233 Program

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Row		Overlap 1	2	3	4	5	6	7	8
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8									
9									
A									
B									
C									
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

	F	Row
Fast Green Flash Phase		0
Green Flash Phases		1
Flashing Walk Phases		2
Guaranteed Passage		3
Simultaneous Gap Term	12345678	4
Sequential Timing		5
Advance Walk Phases		6
Delay Walk Phases		7
External Recall		8
Start-up Overlap Green		9
Max Extension		A
Inhibit Ped Reservice		B
Semi-Actuated		C
Start-up Overlap Yellow		D
Start-up Vehicle Calls	12345678	E
Start-up Ped Calls	12345678	F

Specials <F/2+F+Row>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4
C	EV-C Phases	1 6
D	EV-D Phases	3
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	2
Ped for 6P Output	6
Ped for 4P Output	4
Ped for 8P Output	
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	

Configuration <E/125+F+Row>

	C
EV-A	
EV-B	
EV-C	
EV-D	
RR-1 *	- - -
RR-2 *	- - -
SE-1	0
SE-2	0

<E/125+C+Row>

Preemption Priority

(* RR-1 is always Highest, and RR-2 is always Second Highest)

Row	
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
A	
B	
C	
D	
E	
F	

	2	Row
		0
Phase 1	0	1
Phase 2	0	2
Phase 3	0	3
Phase 4	0	4
Phase 5	0	5
Phase 6	0	6
Phase 7	0	7
Phase 8	0	8
		9
		A
		B
		C
		D
		E
		F

<C/5+2+Row>

Coordination Transition Minimums

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Extra 2 Flags
1 = AWB During Initial
2 = LMU Installed
3 = Disable Min Walk
4 = QuicNet/4 System
5 = Ignore P/P on EV
6 =
7 = Reserved
8 =

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Time and Date

Begin Month	0	<C/5+2+A>
Begin Week	0	<C/5+2+B>
End Month	0	<C/5+2+C>
End Week	0	<C/5+2+D>

Daylight Savings Time

Daylight Savings Date:
If set to all zeros, standard dates will be used.

INTERS CTION: HAZARD WY & RUFFIN RD

233 Program

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Row	Detector Name	0 C1 Pin Number	1 Attributes	2 Phase(s)	3 Assign	1 Delay	3 Carry-Over
0	2I2U	39	45_7_	2	123 8		1.8
1	6J2U	40	45_7_	6	123 8		1.8
2	4I6U	41	45_7_	4	123 8	12.0	
3		42	45_7_	8	123 8		
4	2I2L	43	45_7_	2	123 8		1.8
5	6J2L	44	45_7_	6	123 8		1.8
6		45	45_7_	4	123 8		
7		46	45_7_	8	123 8		
8		47	67_	2	123 8		
9		48	67_	6	123 8		
A		49	67_	4	123 8		
B		50	67_	8	123 8		
C		55	45_7_	5	123 8		
D		56	45_7_	1 7	123 8		
E		57	45_7_	7	123 8		
F		58	45_7_	3	123 8		

Row	Detector Name	4 C1 Pin Number	5 Attributes	6 Phase(s)	7 Assign	2 Delay	4 Carry-Over
0		59	45_7_	5	123 8		
1		60	45_7_	1 7	123 8		
2		61	45_7_	7	123 8		
3		62	45_7_	3	123 8		
4		63	45_7_	2	123 8		
5		64	45_7_	6	123 8		
6		65	45_7_	4	123 8		
7		66	45_7_	8	123 8		
8		67	2	2	123 8		
9		68	2	6	123 8		
A		69	2	4	123 8		
B		70	2	8	123 8		
C		76	45_7_	2	123 8		
D		77	45_7_	6	123 8		
E		78	45_7_	4	123 8		
F		79	45_7_	8	123 8		

Detector Assignments <E/126+Column+Row> <D/0+Column+Row>

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 =
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

Program Type:

	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	0

<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	5	<D/0+0+1>
Max ON (minutes)	60	<D/0+0+2>

Detector Failure Monitor

Row		D
0		
1	Output Port 1	
2	Output Port 2	
3	Output Port 3	
4	Output Port 4	
5	Output Port 5	
6	Output Port 6	
7	Output Port 7	

Dimming <E/125+D+Row>

	D
Number of Digits	
1 st Digit	
2 ed Digit	
3 ed Digit	
4 th Digit	
5 th Digit	
6 th Digit	
7 th Digit	
8 th Digit	
9 th Digit	
10 th Digit	
11 th Digit	
12 th Digit	
13 th Digit	
14 th Digit	
15 th Digit	

<C/5+D+Row>

Dial-Back Telephone Number

Disable Alarms
1 = Stop Time
2 = Flash Sense
3 = Keyboard Entry
4 = Manual Plan
5 = Police Control
6 = External Alarm
7 = Detector Failure
8 =

Row		B
A	DELAY-A	1
B	DELAY-B	1
C	DELAY-C	0
D	DELAY-D	0
E	DELAY-E	0
F	DELAY-F	0

<D/0+B+Row> (seconds)

Delay Logic Times

Omit Alarm	

<C/5+F+0>

Disable Alarm Reporting

Time	0	<C/5+C+0>

Redial Time (minutes)
(View Redial Timer at E/2+D+6)

INTERSECTION: HAZARD WY & RUFFIN RD

233 Program

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Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.1+Row>
(Bank 1)

Time	Funct.	Day of Week	Column 4 Phases/Bits

TOD Function <7/0.1+Row> <E/27+4+Row>

Row	Day	Year	Month	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Dates <8/1.1+Row>
(Bank 1)

Time	Plan	Offset	Holiday Type	Row
				0
				1
				2
				3
				4
				5
				6
				7
				8
				9
				A
				B
				C
				D
				E
				F

Holiday Events <9/1.1+Row>
(Bank 1)

T.O.D. Functions:
0 =
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 8

Plan Select:
1 thru 9 = Coordination Plan 1 thru 9
14 or E = Free
15 or F = Flash

Month Select:
1 = January
2 = February
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = September
A = October
B = November
C = December

Cycle Timer:
Master: C/0 + A + 0
Ring A: C/0 + B + 0
Ring B: C/0 + D + 0

Interval Timer:
Ring A: F/0 + A + Interval Row
Ring B: F/0 + B + Interval Row

Master Plan: C/0 + A + 2
Current Plan: C/0 + A + 3
TOD Plan: C/0 + A + 5

Row	Time	Plan	Offset	Day of Week
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Coordination <9/0.2+Row>
(Bank 2)

Time	Funct.	Holiday Type	Column 4 Phases/Bits

Holiday TOD Function <7/0.2+Row> <E/28+Row>

Row	Day	Year	Month	Holiday Type
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

Holiday Dates <8/1.2+Row>
(Bank 2)

Time	Plan	Offset	Holiday Type	Row
				0
				1
				2
				3
				4
				5
				6
				7
				8
				9
				A
				B
				C
				D
				E
				F

Holiday Events <9/1.2+Row>
(Bank 2)

INTERS TION: HAZARD WY & RUFFIN RD

233 Pr ram

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Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row	Plan Name ---->	Plan 1	2	3	4	5	6	7	8	9	Row
0	Cycle Length										0
1	Phase 1 - ForceOff										1
2	Phase 2 - ForceOff										2
3	Phase 3 - ForceOff										3
4	Phase 4 - ForceOff										4
5	Phase 5 - ForceOff										5
6	Phase 6 - ForceOff										6
7	Phase 7 - ForceOff										7
8	Phase 8 - ForceOff										8
9	Ring Offset										9
A	Offset 1										A
B	Offset 2										B
C	Offset 3										C
D	Perm 1 - End										D
E	Hold Release										E
F	Zone Offset										F

Coordination - Timing Plans <C/1+Plan+Row>

	E	Row
		0
Plan 1 - Sync		1
Plan 2 - Sync		2
Plan 3 - Sync		3
Plan 4 - Sync		4
Plan 5 - Sync		5
Plan 6 - Sync		6
Plan 7 - Sync		7
Plan 8 - Sync		8
Plan 9 - Sync		9
NEMA Sync		A
NEMA Hold		B
		C
		D
Coord Extra		E
		F

Sync Phases <C/1+E+Row>

Row											Row
0	Ped Adjustment										0
1	Perm 2 - Start										1
2	Perm 2 - End										2
3	Perm 3 - Start										3
4	Perm 3 - End										4
5	Reservice Time										5
6	Reservice Phases										6
7											7
8	Pretimed Phases										8
9	Max Recall										9
A	Perm 1 Veh Phase										A
B	Perm 1 Ped Phase										B
C	Perm 2 Veh Phase										C
D	Perm 2 Ped Phase										D
E	Perm 3 Veh Phase										E
F	Perm 3 Ped Phase										F

Coordination - Parameters <C/2+Plan+Row>

	F	Row
Free Lag		0
Plan 1 - Lag		1
Plan 2 - Lag		2
Plan 3 - Lag		3
Plan 4 - Lag		4
Plan 5 - Lag		5
Plan 6 - Lag		6
Plan 7 - Lag		7
Plan 8 - Lag		8
Plan 9 - Lag		9
External Lag		A
		B
		C
		D
		E
		F

Lag Phases <C/1+F+Row>

Coordination Timing By:

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Spec. Funct. 1		NOT-3		Max 2		Pretimed		Set Monday		Dial 2 (7-Wire)		Sim Term		0
1	Spec. Funct. 2		NOT-4		System Det 1		Plan 1		Ext. Perm 1		Dial 3 (7-Wire)		EV-A	71	1
2	Spec. Funct. 3		OR-4 (a)		System Det 2		Plan 2		Ext. Perm 2		Offset 1 (7-Wire)		EV-B	72	2
3	Spec. Funct. 4		OR-4 (b)		System Det 3		Plan 3		Dimming		Offset 2 (7-Wire)		EV-C	73	3
4	NAND-3 (a)		OR-5 (a)		System Det 4		Plan 4		Set Clock		Offset 3 (7-Wire)		EV-D	74	4
5	NAND-3 (b)		OR-5 (b)		System Det 5		Plan 5		Stop Time		Free (7-Wire)		RR-1	51	5
6	NAND-4 (a)		OR-6 (a)		System Det 6		Plan 6		Flash Sense	81	Flash (7-Wire)		RR-2	52	6
7	NAND-4 (b)		OR-6 (b)		System Det 7		Plan 7		Manual Enable		Excl. Ped Omit		Spec. Event 1		7
8	OR-7 (a)		Fig 3 Diamond		System Det 8		Plan 8		Man. Advance		NOT-1		Spec. Event 2		8
9	OR-7 (b)		Fig 4 Diamond		Max Inhibit (nema)		Plan 9		External Alarm		NOT-2		External Lag		9
A	OR-7 (c)		AND-4 (a)		Force A (nema)		DELAY-A		Phase Bank 2		OR-1 (a)		AND-1 (a)		A
B	OR-7 (d)		AND-4 (b)		Force B (nema)		DELAY-B		Phase Bank 3		OR-1 (b)		AND-1 (b)		B
C	OR-8 (a)		NAND-1 (a)		C.N.A. (nema)		DELAY-C		Overlap Set 2		OR-2 (a)		AND-2 (a)		C
D	OR-8 (b)		NAND-1 (b)		Hold (nema)		DELAY-D		Overlap Set 3		OR-2 (b)		AND-2 (b)		D
E	OR-8 (c)		NAND-2 (a)		Max Recall		DELAY-E		Detector Set 2		OR-3 (a)		AND-3 (a)		E
F	OR-8 (d)		NAND-2 (b)		Min Recall		DELAY-F		Detector Set 3		OR-3 (b)		AND-3 (b)		F

Assignable Inputs **<E/126+Column+Row>**

Row	Column 9		Column A		Column B		Column C		Column D		Column E		Column F		Row
0	Phase ON - 1		Preempt Fail		Flasher 0		Free		NOT-1		TOD Out 1		Dial 2 (7-Wire)		0
1	Phase ON - 2		Sp Evnt Out 1		Flasher 1		Plan 1		OR-1		TOD Out 2		Dial 3 (7-Wire)		1
2	Phase ON - 3		Sp Evnt Out 2		Fast Flasher		Plan 2		OR-2		TOD Out 3		Offset 1 (7-Wire)		2
3	Phase ON - 4		Sp Evnt Out 3		Fig 3 Diamond		Plan 3		OR-3		TOD Out 4		Offset 2 (7-Wire)		3
4	Phase ON - 5		Sp Evnt Out 4		Fig 4 Diamond		Plan 4		AND-1		TOD Out 5		Offset 3 (7-Wire)		4
5	Phase ON - 6		Sp Evnt Out 5				Plan 5		AND-2		TOD Out 6		Free (7-Wire)		5
6	Phase ON - 7		Sp Evnt Out 6				Plan 6		AND-3		TOD Out 7		Flash (7-Wire)		6
7	Phase ON - 8		Sp Evnt Out 7				Plan 7		NOT-2		TOD Out 8		Preempt		7
8	Ph. Check - 1		Sp Evnt Out 8		NOT-3		Plan 8		EV-A		Adv. Warn - 1		Low Priority A		8
9	Ph. Check - 2				NOT-4		Plan 9		EV-B		Adv. Warn - 2		Low Priority B		9
A	Ph. Check - 3		Detector Fail		OR-4		Spec. Funct. 3		EV-C		DELAY-A		Low Priority C		A
B	Ph. Check - 4		Spec. Funct. 1		OR-5		Spec. Funct. 4		EV-D		DELAY-B		Low Priority D		B
C	Ph. Check - 5		Spec. Funct. 2		OR-6		NAND-3		RR-1		DELAY-C				C
D	Ph. Check - 6		Central Control		AND-4		NAND-4		RR-2		DELAY-D				D
E	Ph. Check - 7		Excl. Ped DW		NAND-1		OR-7		Spec. Event 1		DELAY-E				E
F	Ph. Check - 8		Excl. Ped WK		NAND-2		OR-8		Spec. Event 2		DELAY-F				F

Assignable Outputs **<E/127+Column+Row>**

IN SECTION: FARNHAM ST & RUFFIN RD

233 Program

Group Assignment:
Field Master Assignment:
System Reference Number:

N/S St.: Ruffin Rd
E/W Street: Farnham St

Last Database Change:

Timing sheets by: REJ
Approved by: BC
Timing implemented on: 1/5/2010

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Row	Phase Numbers--->	1	2	3	4	5	6	7	8
		Ruffin Rd			Farnham		Ruffin Rd		Farnham
0	Ped Walk		7		7		7		7
1	Ped FDW		13		24		13		24
2	Min Green	4	10		7	4	10		7
3	Type 3 Disconnect								
4	Added per Vehicle								
5	Veh Extension	2.0	5.7		2.0	2.0	5.7		2.0
6	Max Gap	2.0	5.7		2.0	2.0	5.7		2.0
7	Min Gap	2.0	0.2		2.0	2.0	0.2		2.0
8	Max Limit	30	60		40	30	60		40
9	Max Limit 2								
A	Adv. / Delay Walk								
B	PE Min Ped FDW								
C	Cond Serv Check								
D	Reduce Every		0.5				0.5		
E	Yellow Change	3.4	4.3		3.9	3.4	4.3		3.9
F	Red Clear	1.0	1.0		1.0	1.0	1.0		1.0

Phase Timing - Bank 1 <F/1+Phase+Row>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	- - -
View EV Clear	- - -
View RR Delay	- - -
View RR Clear	- - -

Preempt Timing <F/1+E+Row>

Row		F
0	Permit	12_456_8
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	*View Set Peds*	
6	Rest In Walk	
7	Red Rest	
8	Double Entry	__4__8
9	Max Recall	
A	Soft Recall	_2__6__
B	Max 2	
C	Cond. Service	
D	Man Cntrl Calls	
E	Yellow Start	_2__6__
F	First Phases	__4__8

Phase Functions <F/1+F+Row>

Current Calculated Cycle Length: C/0 + B + F

	9	A	B	C	D
	- - -	- - -	- - -	- - -	- - -
Phase 1					
Phase 2					
Phase 3					
Phase 4					
Phase 5					
Phase 6					
Phase 7					
Phase 8					
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <F/1+Column+Phase>

Drop Number	17	<C/0+0+0>
Zone Number	17	<C/0+0+1>
Area Number	5	<C/0+0+2>
Area Address	116	<C/0+0+3>
QuicNet Channel	COM37	(QuicNet)

Communication Addresses

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

(Outputs specified in Assignable Outputs at E/127+A+E & F)

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase

Flash Start	0	<F/1+0+E>
Red Revert	5.0	<F/1+0+F>
All Red Start	0.0	<F/1+C+0>

Start / Revert Times

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Manual Plan	14	<C/0+A+1>
Manual Offset	0	<C/0+B+1>

Manual Selection

Notes:

Free Lag	_2_4_6_8	<C/1+F+0>

How to Set Page Access Code:
F/1 -- C + 0 + F = 1

INTERSECTION: FARNHAM ST & RUFFIN RD

233 Program

18

Row		Overlap 1	2	3	4	5	6	7	8
0	Load Switch Number								
1	Veh Set 1 - Phases								
2	Veh Set 2 - Phases								
3	Veh Set 3 - Phases								
4	Neg Veh Phases								
5	Neg Ped Phases								
6	Green Omit Phases								
7	Green Clear Omit Phs.								
8									
9									
A									
B									
C									
D	Green Clear								
E	Yellow Change								
F	Red Clear								

Overlap Assignments <E/29+Column+Row>

	F	Row
Fast Green Flash Phase		0
Green Flash Phases		1
Flashing Walk Phases		2
Guaranteed Passage		3
Simultaneous Gap Term	12345678	4
Sequential Timing		5
Advance Walk Phases		6
Delay Walk Phases		7
External Recall		8
Start-up Overlap Green		9
Max Extension		A
Inhibit Ped Reservice		B
Semi-Actuated		C
Start-up Overlap Yellow		D
Start-up Vehicle Calls	12345678	E
Start-up Ped Calls	12345678	F

Specials <F/2+F+Row>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Flash to PE Circuits	
6	Flash Entry Phases	
7	Disable Yellow Range	
8	Disable Ovp Yel Range	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5___
B	EV-B Phases	___4____
C	EV-C Phases	1____6__
D	EV-D Phases	_____8
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Configuration <E/125+E+Row>

	F
Ext. Permit 1 Phases	
Ext. Permit 2 Phases	
Exclusive Ped Assign	
Preempt Non-Lock	12345678
Ped for 2P Output	_2_____
Ped for 6P Output	_____6__
Ped for 4P Output	___4____
Ped for 8P Output	_____8
Yellow Flash Phases	
Low Priority A Phases	
Low Priority B Phases	
Low Priority C Phases	
Low Priority D Phases	
Restricted Phases	
Extra 2 Config. Bits	

Configuration <E/125+F+Row>

	C	Row
EV-A		0
EV-B		1
EV-C		2
EV-D		3
RR-1 *	- - -	4
RR-2 *	- - -	5
SE-1	0	6
SE-2	0	7
		8
		9
		A
		B
		C
		D
		E
		F

<E/125+C+Row>

Preemption Priority

(* RR-1 is always Highest, and RR-2 is always Second Highest)

	2	Row
		0
Phase 1	0	1
Phase 2	0	2
Phase 3	0	3
Phase 4	0	4
Phase 5	0	5
Phase 6	0	6
Phase 7	0	7
Phase 8	0	8
		9
		A
		B
		C
		D
		E
		F

<C/5+2+Row>

Coordination Transition Minimums

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Extended Status
6 = International Ped
7 = Flash - Clear Outputs
8 = Split Ring

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Extra 2 Flags
1 = AWB During Initial
2 = LMU Installed
3 = Disable Min Walk
4 = QuicNet/4 System
5 = Ignore P/P on EV
6 =
7 = Reserved
8 =

Flash to PE & PE Non-Lock
1 = EV A 5 = RR 1
2 = EV B 6 = RR 2
3 = EV C 7 = SE 1
4 = EV D 8 = SE 2

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Time and Date

Begin Month	0	<C/5+2+A>
Begin Week	0	<C/5+2+B>
End Month	0	<C/5+2+C>
End Week	0	<C/5+2+D>

Daylight Savings Time

Daylight Savings Date:
If set to all zeros, standard dates will be used.

INTERSECTION: FARNHAM ST & RUFFIN RD

233 Program

(18)

Row	Detector Name	0 C1 Pin Number	1 Attributes	2 Phase(s)	3 Assign	1 Delay	3 Carry-Over
0	2I2U	39	45_7_	2	123 8		1.8
1	6J2U	40	45_7_	6	123 8		1.8
2	4I6U	41	45_7_	4	123 8	12.0	
3	8J6U	42	45_7_	8	123 8	12.0	
4	2I2L	43	45_7_	2	123 8		1.8
5	6J2L	44	45_7_	6	123 8		1.8
6		45	45_7_	4	123 8		
7		46	45_7_	8	123 8		
8		47	67_	2	123 8		
9		48	67_	6	123 8		
A		49	67_	4	123 8		
B		50	67_	8	123 8		
C		55	45_7_	5	123 8		
D		56	45_7_	1 7_	123 8		
E		57	45_7_	7_	123 8		
F		58	45_7_	3	123 8		

Row	Detector Name	4 C1 Pin Number	5 Attributes	6 Phase(s)	7 Assign	2 Delay	4 Carry-Over
0		59	45_7_	5	123 8		
1		60	45_7_	1 7_	123 8		
2		61	45_7_	7_	123 8		
3		62	45_7_	3	123 8		
4		63	45_7_	2	123 8		
5		64	45_7_	6	123 8		
6		65	45_7_	4	123 8		
7		66	45_7_	8	123 8		
8		67	2	2	123 8		
9		68	2	6	123 8		
A		69	2	4	123 8		
B		70	2	8	123 8		
C		76	45_7_	2	123 8		
D		77	45_7_	6	123 8		
E		78	45_7_	4	123 8		
F		79	45_7_	8	123 8		

Detector Assignments <E/126+Column+Row> <D/0+Column+Row>

Program Type:

	Ped / Phase / Overlap 1	2	3	4	5	6	7	8	Row
Walk									0
Don't Walk									1
Phase Green									2
Phase Yellow									3
Phase Red									4
Overlap Green									5
Overlap Yellow									6
Overlap Red									7

Redirect Phase Outputs <E/127+Column+Row>

Cabinet Type	0

<E/125+D+0>

Enable Redirection
(Enable Redirection = 30)

Max OFF (minutes)	5	<D/0+0+1>
Max ON (minutes)	60	<D/0+0+2>

Detector Failure Monitor

	D	Row
		0
Output Port 1		1
Output Port 2		2
Output Port 3		3
Output Port 4		4
Output Port 5		5
Output Port 6		6
Output Port 7		7

Dimming <E/125+D+Row>

Detector Attributes
1 = Full Time Delay
2 = Ped Call
3 =
4 = Count
5 = Extension
6 = Type 3
7 = Calling
8 = Alternate

Det. Assignments
1 = Det. Set 1
2 = Det. Set 2
3 = Det. Set 3
4 =
5 =
6 = Failure - Min Recall
7 = Failure - Max Recall
8 = Report on Failure

	D
Number of Digits	
1 st Digit	
2 ed Digit	
3 ed Digit	
4 th Digit	
5 th Digit	
6 th Digit	
7 th Digit	
8 th Digit	
9 th Digit	
10 th Digit	
11 th Digit	
12 th Digit	
13 th Digit	
14 th Digit	
15 th Digit	

<C/5+D+Row>

Dial-Back Telephone Number

Disable Alarms
1 = Stop Time
2 = Flash Sense
3 = Keyboard Entry
4 = Manual Plan
5 = Police Control
6 = External Alarm
7 = Detector Failure
8 =

	B	Row
DELAY-A	1	A
DELAY-B	1	B
DELAY-C	0	C
DELAY-D	0	D
DELAY-E	0	E
DELAY-F	0	F

<D/0+B+Row> (seconds)

Delay Logic Times

Omit Alarm	

<C/5+F+0>

Disable Alarm Reporting

Time	0	<C/5+C+0>

Redial Time (minutes)
(View Redial Timer at E/2+D+6)

LIGHTWAVE AV

20

INTERSECTION: RUFFIN CT & RUFFIN RD

Program

Group Assignment: NONE
Field Master Assignment: NONE

N/S Street Name: RUFFIN RD
E/W Street Name: RUFFIN CT

Last Database Change: 09/07/2000 17:01
Timing Sheet By: JMV
Approved By:
System Ref. Number: 585
Drawing Number: 29738-44-D
Timing Implemented On:

N

Row	Column # ---> / Phase # --->	Phase 1	2	3	4	5 (4+5)	6	7 (6+7)	8
0	Ped Walk	0	7	0	7	0	7	0	7
1	Ped FDW	0	13	0	24	0	21	0	27
2	Min Green	4	10	4	4	4	10	4	4
3	Type 3 Limit	0	0	0	0	0	0	0	0
4	Add/Veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Veh Extn	2.0	4.0	2.0	3.4	2.0	4.0	2.0	2.0
6	Max Gap	2.0	4.0	2.0	3.4	2.0	4.0	2.0	2.0
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	2.0
8	Max Limit	30	60	30	40	30	60	30	40
9	Max Limit 2	0	0	0	0	0	0	0	0
A	Bus Adv	0	0	0	0	0	0	0	0
B	Call to Phs	0	0	0	0	0	0	0	0
C	Reduce By	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
D	Every	0.0	0.8	0.0	1.0	0.0	0.8	0.0	0.0
E	Yellow	3.0	4.5	3.0	3.6	3.0	4.5	3.0	3.0
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Phase Timing - Bank 1
F + Phase + Row
<F Page>

	E
RR-1 Delay	0
RR-1 Clear	0
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	0
RR-2 Clear	0
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	
6	Rest In Wal	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2___6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	__3___7_

Phase Functions <F Page>
F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	13	C + 0 + 0
Zone Number	13	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	56	C + 0 + 3
QuicNet Channel	DIGI33:	(QuicNet)

Communication Addresses

Row		9 Green Clear	C Yellow - Change	D Red Clear	0 Load-Switch #
A	Overlap A	0.0	0.0	0.0	0
B	Overlap B	0.0	0.0	0.0	0
C	Overlap C	0.0	0.0	0.0	0
D	Overlap D	0.0	0.0	0.0	0

Overlap Timing <F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

C + F + O

	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Downtime Flash	60	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Printed on 09/07/2000 5:19 PM

City of San Diego

INTERSECTION: RUFFIN CT & RUFFIN RD

223 F am

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Row	Time	Function	Day of Week	Column F Phases/Bits
0	00 : 00	0		
1	00 : 00	0		
2	00 : 00	0		
3	00 : 00	0		
4	00 : 00	0		
5	00 : 00	0		
6	00 : 00	0		
7	00 : 00	0		
8	00 : 00	0		
9	00 : 00	0		
A	00 : 00	0		
B	00 : 00	0		
C	00 : 00	0		
D	00 : 00	0		
E	00 : 00	0		
F	00 : 00	0		

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	45
B	Overlap B - Phases	67
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1

Configuration

E + F + ROW

<E Page>

Day of Week
1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	4
6	Overlap B - Green Omit	6
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

E + E + ROW

For access, set F + 0 + E = 1

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date
8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)
(This parameter is NOT downloaded)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

INTERSECTION: RUFFIN CT & RUFFIN RD

223 Program

Row	1 Delay	3 Carry-over	Detector Name	332 Input File	Detector Number
0	0.0	0.0		1I1	14
1	0.0	1.8		2I2U	1
2	0.0	0.0		2I2L	5
3	0.0	0.0		2I3U	21
4	0.0	0.0		2I3L	25
5	0.0	0.0		2I4	9
6	0.0	0.0		3I5	16
7	0.0	1.8		4I6U	3
8	0.0	0.0		4I6L	7
9	0.0	0.0		4I7U	23
A	0.0	0.0		4I7L	27
B	0.0	0.0		4I8	11
C	0.0	0.0		1I9U	18
D	0.0	0.0		3I9L	20
E	---	---	---	---	---
F	---	---	---	---	---

Row	2 Delay	4 Carry-over	Detector Name	332 Input File	Detector Number
0	0.0	0.0		5J1	13
1	0.0	1.8		6J2U	2
2	0.0	0.0		6J2L	6
3	0.0	0.0		6J3U	22
4	0.0	0.0		6J3L	26
5	0.0	0.0		6J4	10
6	0.0	0.0		7J5	15
7	0.0	0.0		8J6U	4
8	0.0	0.0		8J6L	8
9	10.0	0.0		8J7U	24
A	0.0	0.0		8J7L	28
B	0.0	0.0		8J8	12
C	0.0	0.0		5J9U	17
D	0.0	0.0		7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
0	1 2 3 4 5 6 7 8	12345678
1	9 10 11 12 -- -- -- --	1234____
2	13 14 15 16 17 18 19 20	12345678
3	-- -- -- -- 21 22 23 24	____5678
4	-- -- -- -- -- -- -- --	1234____
5	-- 25 26 27 28 -- -- --	_2345___

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)
(These parameters are NOT downloaded.)

SPECTRUM CENTER

IN SECTION: ~~Kearny Spectrum~~ Bl & Ruffin Rd

22 rogram

(21)

Group Assignment:
Field Master Assignment: None

N/S Street Name: Ruffin Rd
E/W Street Name: Kearny Spectrum Bl

Last Change:
Timing Sheet By: JMV
Approved By:

Drawing Number: 29738-45-D
System Ref. Number:
Timing implemented on:

Row	Column # ---->	Ruffin	Driveway	~~Kearny~~ Spectrum	Ruffin				
	Phase # ---->	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		
1	Ped FDW		22		22		20		
2	Min Green	4	10	4	4	4	10		
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	4.0	2.0	4.4	2.0	4.0		
6	Max Gap	2.0	4.0	2.0	4.4	2.0	4.0		
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2		
8	Max Limit	30	60	30	40	30	60		
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		
D	Every		0.8		0.7		0.8		
E	Yellow	3.4 ~~3.0~~	4.5	3.9 ~~3.0~~	4.3	3.4 ~~3.0~~	4.5		
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0		

EFF 5/17/11

Phase Timing - Bank 1 <F Page>
F + Phase + Row

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing
F + E + Row

Row		F
0	Permit	123456__
1	Red Lock	
2	Yellow Lock	
3	Min Recall	
4	Ped Recall	
5	Peds (View)	_2_4_6_
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2___6__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	__3_____

Phase Functions <F Page>
F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number		C + 0 + 0
Zone Number		C + 0 + 1
Area Number		C + 0 + 2
Area Address		C + 0 + 3
QuicNet Channel		(QuicNet)

Communication Addresses

	F	Row
C + F + O Free Lag	_2_4_6__	0

Lag Phases <C Page>

Row		9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
A	Overlap A				
B	Overlap B				
C	Overlap C				
D	Overlap D				

Overlap Timing <F Page> <D Page>
F + COLOR + D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset 0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	60	(minutes)

Downtime Before Auto Manual Flash
F + 0 + 8

Disable Ports	234

Disable Communications Ports
D + D + 9

21

Row	Time	Function	Day of Week	Column F Phases/Bits
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	_____6__
7	Ped 4P	___4____
8	Ped 8P	
9	Yellow Flash Phases	
A	Overlap A - Phases	___45___
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1_____

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	___4____
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5___
B	EV-B Phases	___4____
C	EV-C Phases	1____6__
D	EV-D Phases	__3_____
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date
8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)
(This parameter is NOT downloaded)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

21

Row	1 Delay	3 Carry-over	Detector Name	332 Input File	Detector Number
0				1I1	14
1		1.8		2I2U	1
2				2I2L	5
3				2I3U	21
4				2I3L	25
5				2I4	9
6				3I5	16
7		1.8		4I6U	3
8				4I6L	7
9	10.0			4I7U	23
A				4I7L	27
B				4I8	11
C				1I9U	18
D				3I9L	20
E		---	---	---	---
F	---	---	---	---	---

Row	2 Delay	4 Carry-over	Detector Name	332 Input File	Detector Number
0				5J1	13
1		1.8		6J2U	2
2				6J2L	6
3				6J3U	22
4				6J3L	26
5				6J4	10
6				7J5	15
7				8J6U	4
8				8J6L	8
9	10.0			8J7U	24
A				8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	5678
E	-- -- -- -- -- -- -- --	1234
F	-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	0
2	System Det. # 2	0
3	System Det. # 3	0
4	System Det. # 4	0
5	System Det. # 5	0
6	System Det. # 6	0
7	System Det. # 7	0
8	System Det. # 8	0

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	0	F+C+1
Time Before Yellow	0.0	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	0	F+D+1
Time Before Yellow	0.0	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

(These parameters are NOT downloaded.)

INTERSECTION: BALBOA AVE @ RUFFIN RD

223 Program

22

Group Assignment:
Field Master Assignment:

N/S Street Name: RUFFIN
E/W Street Name: BALBOA

Row	Column # --->	1	2	3	4	5	6	7	8
		BALBOA			RUFFIN		BALBOA		RUFFIN
	Phase # --->	1	2	3	4	5	6	7	8
								OLA B	
0	Ped Walk		7		7		7		7
1	Ped FDW		23		23		27		33
2	Min Green	4	7	4	7	4	7	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.1	2.0	4.4	2.0	3.4	2.0	4.2
6	Max Gap	2.0	3.1	2.0	4.4	2.0	3.4	2.0	4.2
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	40 ~~30~~	60	30	40	30	60	30	40
9	Max Limit 2		25		30		90		30
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		1.0		0.7		0.9		0.7
E	Yellow	3.4	4.3	3.4	4.3	3.4	4.1	3.4	4.4
F	Red Clear	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

F + E + Row

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2___6__
4	Ped Recall	
5	Peds (View)	_2_4_6_8
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2___6__
F	1st Phases	___4___8

F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	7	C + 0 + 0
Zone Number	7	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	66	C + 0 + 3
QuicNet Channel	DIGI37:	(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	_2_4_6_8	0

Lag Phases <C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Timing Sheet By: MS2
Approved By: EFF
Drawing Number: 30794-10-D
Timing Implemented On:

Sent to street
DIV. on 01/15/09
to be implemented

HS

22

Row	Time	Function	Day of Week	Column F Phases/Bits
0	06 : 00	B	_234567	_2_4_6_8
1	09 : 00	B	_234567	
2	06 : 00	C	_234567	1_____
3	09 : 00	C	_234567	
4				
5				
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest in Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	_____6__
7	Ped 4P	___4____
8	Ped 8P	_____8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	_____67_
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1_____

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 = Bus Advance

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	_____6__
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	_2__5____
B	EV-B Phases	___4__7_
C	EV-C Phases	1____6__
D	EV-D Phases	__3____8
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

For access, set F + 9 + E = 1

Configuration

E + E + ROW

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

22

Row	1 Delay	3 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		1.8
9		
A	10.0	
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8	10.0	
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234____
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	____5678
E	-- -- -- -- -- -- -- --	1234____
F	-- 25 26 27 28 -- -- --	_2345___

Active Detectors <D Page>

Row		0 Detector #
0		
1	System Det. # 1	
2	System Det. # 2	
3	System Det. # 3	
4	System Det. # 4	
5	System Det. # 5	
6	System Det. # 6	
7	System Det. # 7	
8	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: BALBOA AVE @ VIEWRIDGE AVE

223 Program

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Group Assignment:
Field Master Assignment:

N/S Street Name: VIEWRIDGE
E/W Street Name: BALBOA

Row	Column # --->	1	2	3	4	5	6	7	8
		BALBOA			VIEWRIDGE		BALBOA		VIEWRIDGE
	Phase # --->	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		
1	Ped FDW		14		34		14		
2	Min Green	4	7		7	4	7		
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.1		2.0	2.0	3.5		
6	Max Gap	2.0	3.1		2.0	2.0	3.5		
7	Min Gap	2.0	0.2		2.0	2.0	0.2		
8	Max Limit	30	60		40	30	60		
9	Max Limit 2		35				35		
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1				0.1		
D	Every		1.0				0.9		
E	Yellow	3.4	5.1		3.9	3.4	4.1		
F	Red Clear	1.0	2.0		1.0	1.0	2.0		

Phase Timing - Bank 1
F + Phase + Row

<F Page>

	E
RR-1 Delay	
RR-1 Clear	
EV-A Delay	
EV-A Clear	
EV-B Delay	
EV-B Clear	
EV-C Delay	
EV-C Clear	
EV-D Delay	
EV-D Clear	
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

F + E + Row

Row		F
0	Permit	12_456__
1	Red Lock	
2	Yellow Lock	
3	Min Recall	_2__6__
4	Ped Recall	
5	Peds (View)	_2_4_6__
6	Rest In Walk	
7	Red Rest	
8	Dbl Entry	
9	Max Recall	
A	Soft Recall	_2__8__
B	Max 2	
C	Cond Serv	
D	Ped Lock	12345678
E	Yellow Start	_2__6__
F	1st Phases	___4____

F + F + Row

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + O

Start / Revert Times

Drop Number	8	C + 0 + 0
Zone Number	8	C + 0 + 1
Area Number	5	C + 0 + 2
Area Address	67	C + 0 + 3
QuicNet Channel	DIGI37:	(QuicNet)

Communication Addresses

C + F + O	F	Row
Free Lag	_2_4_6__	0

Lag Phases <C Page>

Overlap Timing

	Row	9 Green Clear	C Yellow Change	D Red Clear	0 Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page> F + COLOR +

<D Page> D + 0 + OVERLAP

Manual Plan	14	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Downtime Flash	255	(minutes)

Downtime Before Auto Manual Flash
F + 0 +8

Disable Ports	_234____

Disable Communication Ports
D + D + 9

Timing Sheet By: MS2
Approved By: EFF
Drawing Number:
Timing Implemented On:

Was sent to streets Div. on 01/15/09 to be implemented

MS

23

Row	Time	Function	Day of Week	Column F Phases/Bits
0	06 : 00	C	_234567	1_____
1	09 : 00	C	_234567	
2	15 : 00	B	_234567	_____6__
3	19 : 00	B	_234567	
4	06 : 00	B	_234567	_2_____
5	09 : 00	B	_234567	
6				
7				
8				
9				
A				
B				
C				
D				
E				
F				

TOD Function <D Page>

7 + ROW D + F + ROW

T.O.D. Functions
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Rest In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	_2_____
6	Ped 6P	_____6__
7	Ped 4P	___4____
8	Ped 8P	
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration <E Page>

E + F + ROW

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs
1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 = Bus Advance

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	
B	EV-B Phases	
C	EV-C Phases	
D	EV-D Phases	
E	Extra 1 Config. Bits	1_345___
F	IC Select (Interconnect)	_2_____

Configuration

For access, set F + 9 + E = 1 E + E + ROW

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags
1 =
2 = Modem
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Disable Parity	0	D+B+0

Dial-Up Telephone Communications
(If set to a non-zero value, parity will be disabled)

Program Information
C + C + 0 = program
C + C + F = version

Remote Download
C + 0 + 4 = 1 -255
w/ E + E + E bit 5 on

23

Row	1 Delay	3 Carry-over
0		
1		1.8
2		1.8
3		1.8
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	2 Delay	4 Carry-over
0		
1		1.8
2		1.8
3		1.8
4		1.8
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Detector Numbers	E
A	1 2 3 4 5 6 7 8	12345678
B	9 10 11 12 -- -- -- --	1234____
C	13 14 15 16 17 18 19 20	12345678
D	-- -- -- -- 21 22 23 24	____5678
E	-- -- -- -- -- -- -- --	1234____
F	-- 25 26 27 28 -- -- --	_2345___

Active Detectors <D Page>

Row		0 Detector #
1		
1	System Det. # 1	
1	System Det. # 2	
1	System Det. # 3	
1	System Det. # 4	
1	System Det. # 5	
1	System Det. # 6	
1	System Det. # 7	
1	System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

B-3

TUBE COUNT SHEETS

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-001

Location: Clairemont Mesa Blvd. btwn. SR-163 NB Ramps & Kearny Villa Rd.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			9		14			12:00			305		282		
00:15			5		18			12:15			293		285		
00:30			9		13			12:30			296		291		
00:45			8	31	9	54	85	12:45			335	1229	294	1152	2381
01:00			5		18			13:00			294		297		
01:15			6		7			13:15			301		292		
01:30			5		12			13:30			269		306		
01:45			8	24	10	47	71	13:45			248	1112	277	1172	2284
02:00			6		5			14:00			250		274		
02:15			11		8			14:15			232		256		
02:30			3		11			14:30			226		312		
02:45			4	24	8	32	56	14:45			235	943	304	1146	2089
03:00			4		10			15:00			222		365		
03:15			7		16			15:15			222		348		
03:30			7		11			15:30			213		424		
03:45			8	26	11	48	74	15:45			225	882	448	1585	2467
04:00			14		6			16:00			245		463		
04:15			8		11			16:15			259		434		
04:30			19		8			16:30			256		465		
04:45			25	66	22	47	113	16:45			278	1038	433	1795	2833
05:00			36		21			17:00			273		503		
05:15			54		29			17:15			275		463		
05:30			63		41			17:30			232		445		
05:45			87	240	46	137	377	17:45			220	1000	327	1738	2738
06:00			114		67			18:00			174		314		
06:15			169		70			18:15			145		262		
06:30			200		90			18:30			131		219		
06:45			307	790	120	347	1137	18:45			109	559	194	989	1548
07:00			366		159			19:00			114		198		
07:15			402		174			19:15			103		166		
07:30			456		210			19:30			91		157		
07:45			497	1721	204	747	2468	19:45			73	381	130	651	1032
08:00			520		206			20:00			67		107		
08:15			487		183			20:15			57		98		
08:30			455		222			20:30			60		97		
08:45			386	1848	206	817	2665	20:45			56	240	92	394	634
09:00			296		228			21:00			55		96		
09:15			241		186			21:15			59		79		
09:30			207		202			21:30			37		64		
09:45			233	977	213	829	1806	21:45			28	179	70	309	488
10:00			222		230			22:00			34		71		
10:15			201		228			22:15			33		43		
10:30			233		235			22:30			16		39		
10:45			216	872	244	937	1809	22:45			17	100	47	200	300
11:00			215		260			23:00			17		36		
11:15			242		268			23:15			14		31		
11:30			276		284			23:30			19		23		
11:45			277	1010	275	1087	2097	23:45			15	65	21	111	176
Total Vol.				7629		5129	**12758**					7728		11242	**18970**

Daily Totals

NB	SB	EB	WB	**Combined**
		15357	16371	**31728**

	AM			**PM**		
Split %	59.8%	40.2%	**40.2%**	40.7%	59.3%	**59.8%**
Peak Hour	07:30	11:45	**07:45**	12:00	16:30	**16:30**
Volume	1960	1133	**2774**	1229	1864	**2946**
P.H.F.	0.94	0.97	**0.96**	0.92	0.93	**0.95**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-002

Location: Clairemont Mesa Blvd. btwn. Kearny Villa Rd. & Overland Ave.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			7		12			12:00			336		309		
00:15			8		8			12:15			303		281		
00:30			12		12			12:30			325		291		
00:45			5	32	8	40	72	12:45			334	1298	282	1163	2461
01:00			8		9			13:00			295		261		
01:15			7		4			13:15			295		262		
01:30			6		13			13:30			289		276		
01:45			12	33	8	34	67	13:45			271	1150	252	1051	2201
02:00			6		1			14:00			237		246		
02:15			14		6			14:15			244		216		
02:30			4		14			14:30			214		233		
02:45			3	27	6	27	54	14:45			231	926	293	988	1914
03:00			6		12			15:00			240		305		
03:15			10		13			15:15			220		270		
03:30			8		11			15:30			219		315		
03:45			10	34	14	50	84	15:45			212	891	235	1125	2016
04:00			15		2			16:00			210		296		
04:15			12		10			16:15			209		278		
04:30			11		4			16:30			220		302		
04:45			23	61	14	30	91	16:45			208	847	285	1161	2008
05:00			24		23			17:00			225		346		
05:15			43		21			17:15			214		278		
05:30			46		38			17:30			191		278		
05:45			77	190	44	126	316	17:45			157	787	214	1116	1903
06:00			82		44			18:00			127		197		
06:15			121		68			18:15			115		144		
06:30			132		89			18:30			107		134		
06:45			186	521	85	286	807	18:45			91	440	118	593	1033
07:00			188		114			19:00			101		121		
07:15			249		115			19:15			110		105		
07:30			261		161			19:30			91		85		
07:45			302	1000	130	520	1520	19:45			69	371	96	407	778
08:00			278		135			20:00			66		59		
08:15			258		144			20:15			58		58		
08:30			266		155			20:30			54		61		
08:45			251	1053	189	623	1676	20:45			58	236	59	237	473
09:00			239		177			21:00			51		50		
09:15			204		179			21:15			61		52		
09:30			180		197			21:30			40		42		
09:45			229	852	226	779	1631	21:45			31	183	42	186	369
10:00			207		206			22:00			34		37		
10:15			191		217			22:15			35		24		
10:30			224		190			22:30			24		22		
10:45			209	831	233	846	1677	22:45			20	113	22	105	218
11:00			227		234			23:00			16		20		
11:15			243		261			23:15			13		21		
11:30			287		288			23:30			18		12		
11:45			293	1050	269	1052	2102	23:45			13	60	12	65	125
Total Vol.				5684		4413	**10097**					7302		8197	**15499**

Daily Totals

NB	SB	EB	WB	**Combined**
		12986	12610	**25596**

	AM			**PM**		
Split %	56.3%	43.7%	**39.4%**	47.1%	52.9%	**60.6%**
Peak Hour	11:45	11:45	**11:45**	12:00	16:15	**12:00**
Volume	1257	1150	**2407**	1298	1211	**2461**
P.H.F.	0.94	0.93	**0.93**	0.97	0.88	**0.95**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-001

Location: Clairemont Mesa Blvd. btwn. Complex St. & Overland Ave.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			6		7			12:00			301		289		
00:15			12		4			12:15			257		281		
00:30			12		15			12:30			280		300		
00:45			10	40	7	33	73	12:45			294	1132	257	1127	2259
01:00			4		9			13:00			267		263		
01:15			11		7			13:15			289		229		
01:30			8		2			13:30			252		251		
01:45			8	31	3	21	52	13:45			226	1034	242	985	2019
02:00			6		4			14:00			225		220		
02:15			5		6			14:15			241		207		
02:30			9		6			14:30			184		211		
02:45			2	22	6	22	44	14:45			190	840	236	874	1714
03:00			7		5			15:00			224		267		
03:15			7		7			15:15			205		192		
03:30			6		10			15:30			191		236		
03:45			7	27	10	32	59	15:45			221	841	223	918	1759
04:00			12		12			16:00			230		255		
04:15			8		13			16:15			209		236		
04:30			9		16			16:30			224		282		
04:45			22	51	13	54	105	16:45			213	876	256	1029	1905
05:00			12		19			17:00			279		302		
05:15			51		20			17:15			229		250		
05:30			37		46			17:30			215		246		
05:45			50	150	51	136	286	17:45			189	912	177	975	1887
06:00			84		69			18:00			157		182		
06:15			76		83			18:15			128		140		
06:30			114		97			18:30			112		138		
06:45			132	406	124	373	779	18:45			116	513	116	576	1089
07:00			145		121			19:00			112		125		
07:15			169		132			19:15			97		92		
07:30			180		156			19:30			92		77		
07:45			218	712	171	580	1292	19:45			86	387	72	366	753
08:00			199		172			20:00			67		93		
08:15			198		153			20:15			57		59		
08:30			178		178			20:30			53		68		
08:45			210	785	183	686	1471	20:45			66	243	58	278	521
09:00			198		164			21:00			51		59		
09:15			186		177			21:15			35		69		
09:30			150		160			21:30			38		41		
09:45			157	691	135	636	1327	21:45			32	156	40	209	365
10:00			165		195			22:00			34		58		
10:15			180		168			22:15			26		32		
10:30			172		187			22:30			18		18		
10:45			201	718	222	772	1490	22:45			15	93	20	128	221
11:00			209		228			23:00			14		16		
11:15			211		246			23:15			19		13		
11:30			243		268			23:30			21		10		
11:45			269	932	275	1017	1949	23:45			17	71	11	50	121
Total Vol.				4565		4362	**8927**					7098		7515	**14613**

Daily Totals

NB	SB	EB	WB	Combined
		11663	11877	**23540**

	AM			PM		
Split %	51.1%	48.9%	**37.9%**	48.6%	51.4%	**62.1%**
Peak Hour	11:45	11:45	**11:45**	12:00	12:00	**12:00**
Volume	1107	1145	**2252**	1132	1127	**2259**
P.H.F.	0.92	0.95	**0.95**	0.94	0.94	**0.96**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-003

Location: Clairemont Mesa Blvd. btwn. Overland Ave. & Ruffin Rd.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			4		6			12:00			304		300		
00:15			7		6			12:15			289		301		
00:30			11		12			12:30			303		321		
00:45			5	27	10	34	61	12:45			318	1214	280	1202	2416
01:00			7		10			13:00			332		276		
01:15			8		5			13:15			272		259		
01:30			7		5			13:30			266		262		
01:45			10	32	7	27	59	13:45			227	1097	220	1017	2114
02:00			10		2			14:00			223		227		
02:15			7		4			14:15			193		214		
02:30			7		14			14:30			210		199		
02:45			1	25	9	29	54	14:45			234	860	215	855	1715
03:00			10		8			15:00			254		195		
03:15			9		10			15:15			221		192		
03:30			2		10			15:30			240		196		
03:45			7	28	14	42	70	15:45			209	924	161	744	1668
04:00			8		11			16:00			217		210		
04:15			8		16			16:15			225		189		
04:30			4		9			16:30			235		194		
04:45			16	36	32	68	104	16:45			214	891	184	777	1668
05:00			12		38			17:00			261		213		
05:15			26		59			17:15			251		214		
05:30			33		62			17:30			219		190		
05:45			58	129	77	236	365	17:45			190	921	176	793	1714
06:00			51		75			18:00			174		129		
06:15			76		144			18:15			111		92		
06:30			66		149			18:30			134		103		
06:45			112	305	156	524	829	18:45			123	542	90	414	956
07:00			122		161			19:00			134		110		
07:15			135		151			19:15			102		74		
07:30			143		168			19:30			131		64		
07:45			173	573	173	653	1226	19:45			83	450	88	336	786
08:00			131		185			20:00			100		59		
08:15			169		184			20:15			71		56		
08:30			147		188			20:30			54		54		
08:45			144	591	200	757	1348	20:45			68	293	49	218	511
09:00			156		170			21:00			67		46		
09:15			164		174			21:15			68		46		
09:30			164		187			21:30			44		33		
09:45			198	682	220	751	1433	21:45			33	212	23	148	360
10:00			183		177			22:00			57		37		
10:15			144		171			22:15			35		16		
10:30			197		149			22:30			25		19		
10:45			176	700	212	709	1409	22:45			21	138	17	89	227
11:00			249		207			23:00			20		16		
11:15			226		251			23:15			19		16		
11:30			254		233			23:30			17		10		
11:45			274	1003	291	982	1985	23:45			9	65	11	53	118
Total Vol.				4131		4812	**8943**					7607		6646	**14253**

Daily Totals

NB	SB	EB	WB	**Combined**
		11738	11458	**23196**

	AM			**PM**		
Split %	46.2%	53.8%	**38.6%**	53.4%	46.6%	**61.4%**
Peak Hour	11:45	11:45	**11:45**	12:15	12:00	**12:15**
Volume	1170	1213	**2383**	1242	1202	**2420**
P.H.F.	0.96	0.94	**0.95**	0.94	0.94	**0.97**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-004

Location: Clairemont Mesa Blvd. btwn. Ruffin Rd. & Murphy Canyon Rd.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			10		8			12:00			247		244		
00:15			9		7			12:15			232		237		
00:30			42		8			12:30			251		227		
00:45			46	107	6	29	136	12:45			214	944	237	945	1889
01:00			16		6			13:00			264		225		
01:15			14		8			13:15			240		220		
01:30			18		7			13:30			243		212		
01:45			11	59	8	29	88	13:45			252	999	209	866	1865
02:00			21		1			14:00			292		234		
02:15			7		5			14:15			207		190		
02:30			19		9			14:30			271		188		
02:45			8	55	11	26	81	14:45			293	1063	202	814	1877
03:00			13		5			15:00			327		158		
03:15			10		10			15:15			309		197		
03:30			2		7			15:30			393		181		
03:45			7	32	17	39	71	15:45			369	1398	205	741	2139
04:00			9		18			16:00			383		176		
04:15			12		21			16:15			348		144		
04:30			9		23			16:30			344		155		
04:45			13	43	78	140	183	16:45			352	1427	169	644	2071
05:00			10		81			17:00			217		168		
05:15			20		112			17:15			333		189		
05:30			29		122			17:30			352		145		
05:45			30	89	190	505	594	17:45			310	1212	132	634	1846
06:00			44		187			18:00			251		102		
06:15			36		207			18:15			200		100		
06:30			69		244			18:30			202		79		
06:45			54	203	283	921	1124	18:45			140	793	85	366	1159
07:00			102		272			19:00			171		73		
07:15			91		237			19:15			131		61		
07:30			98		317			19:30			133		52		
07:45			124	415	352	1178	1593	19:45			102	537	52	238	775
08:00			116		376			20:00			124		41		
08:15			146		372			20:15			88		37		
08:30			131		288			20:30			68		36		
08:45			111	504	251	1287	1791	20:45			98	378	33	147	525
09:00			179		266			21:00			114		29		
09:15			159		239			21:15			89		32		
09:30			147		214			21:30			63		30		
09:45			158	643	245	964	1607	21:45			70	336	22	113	449
10:00			169		190			22:00			87		19		
10:15			166		196			22:15			52		15		
10:30			173		163			22:30			37		9		
10:45			192	700	199	748	1448	22:45			32	208	13	56	264
11:00			217		197			23:00			31		8		
11:15			259		211			23:15			33		8		
11:30			235		212			23:30			27		5		
11:45			263	974	214	834	1808	23:45			16	107	11	32	139
Total Vol.				3824		6700	**10524**					9402		5596	**14998**

Daily Totals

NB	SB	EB	WB	**Combined**
		13226	12296	**25522**

	AM			**PM**		
Split %	36.3%	63.7%	**41.2%**	62.7%	37.3%	**58.8%**
Peak Hour	11:15	07:30	**11:45**	15:30	12:00	**15:15**
Volume	1004	1417	**1915**	1493	945	**2213**
P.H.F.	0.95	0.94	**0.98**	0.95	0.97	**0.96**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-005

Location: Clairemont Mesa Blvd. btwn. Murphy Canyon Rd. & I-15

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			9		4			12:00			211		154		
00:15			11		4			12:15			195		156		
00:30			42		5			12:30			204		153		
00:45			44	106	4	17	123	12:45			178	788	162	625	1413
01:00			13		4			13:00			222		146		
01:15			13		7			13:15			218		151		
01:30			18		4			13:30			226		138		
01:45			10	54	8	23	77	13:45			219	885	160	595	1480
02:00			18		0			14:00			263		154		
02:15			7		5			14:15			193		146		
02:30			19		5			14:30			240		127		
02:45			8	52	6	16	68	14:45			253	949	156	583	1532
03:00			12		7			15:00			296		103		
03:15			9		8			15:15			302		140		
03:30			2		4			15:30			382		121		
03:45			10	33	12	31	64	15:45			309	1289	157	521	1810
04:00			7		12			16:00			450		183		
04:15			11		16			16:15			409		167		
04:30			9		21			16:30			425		166		
04:45			12	39	57	106	145	16:45			395	1679	178	694	2373
05:00			7		48			17:00			393		162		
05:15			18		75			17:15			396		192		
05:30			29		99			17:30			402		156		
05:45			31	85	129	351	436	17:45			345	1536	156	666	2202
06:00			42		155			18:00			230		121		
06:15			37		242			18:15			191		73		
06:30			69		247			18:30			203		51		
06:45			54	202	387	1031	1233	18:45			139	763	52	297	1060
07:00			90		317			19:00			177		36		
07:15			91		328			19:15			143		35		
07:30			96		377			19:30			139		38		
07:45			118	395	430	1452	1847	19:45			94	553	32	141	694
08:00			102		416			20:00			121		24		
08:15			107		420			20:15			84		23		
08:30			129		344			20:30			69		23		
08:45			106	444	308	1488	1932	20:45			93	367	19	89	456
09:00			139		197			21:00			121		17		
09:15			139		184			21:15			95		19		
09:30			146		165			21:30			63		19		
09:45			139	563	176	722	1285	21:45			77	356	23	78	434
10:00			151		157			22:00			84		10		
10:15			137		137			22:15			48		9		
10:30			166		112			22:30			39		5		
10:45			176	630	141	547	1177	22:45			30	201	7	31	232
11:00			186		129			23:00			34		2		
11:15			219		141			23:15			29		4		
11:30			212		147			23:30			31		3		
11:45			235	852	125	542	1394	23:45			14	108	6	15	123
Total Vol.				3455		6326	**9781**					9474		4335	**13809**

Daily Totals

NB	SB	EB	WB	**Combined**
		12929	10661	**23590**

	AM			**PM**		
Split %	35.3%	64.7%	**41.5%**	68.6%	31.4%	**58.5%**
Peak Hour	11:15	07:30	**07:30**	16:00	16:30	**16:00**
Volume	877	1643	**2066**	1679	698	**2373**
P.H.F.	0.93	0.96	**0.94**	0.93	0.91	**0.94**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-002

Location: Lightwave Ave. btwn. Overland Ave. & Ruffin Rd.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		3			12:00			64		100		
00:15			2		0			12:15			58		82		
00:30			1		1			12:30			57		67		
00:45			0	3	1	5	8	12:45			59	238	86	335	573
01:00			1		0			13:00			57		90		
01:15			2		1			13:15			63		78		
01:30			1		2			13:30			38		60		
01:45			1	5	0	3	8	13:45			39	197	44	272	469
02:00			1		0			14:00			34		49		
02:15			3		0			14:15			26		46		
02:30			3		0			14:30			31		65		
02:45			3	10	0	0	10	14:45			33	124	54	214	338
03:00			2		0			15:00			30		52		
03:15			4		1			15:15			37		51		
03:30			6		0			15:30			36		63		
03:45			4	16	2	3	19	15:45			29	132	54	220	352
04:00			4		1			16:00			49		73		
04:15			5		0			16:15			45		57		
04:30			2		2			16:30			59		71		
04:45			5	16	8	11	27	16:45			59	212	60	261	473
05:00			8		20			17:00			98		69		
05:15			10		23			17:15			82		74		
05:30			13		12			17:30			64		92		
05:45			12	43	18	73	116	17:45			41	285	62	297	582
06:00			12		28			18:00			49		71		
06:15			16		33			18:15			34		55		
06:30			18		45			18:30			35		63		
06:45			32	78	44	150	228	18:45			28	146	37	226	372
07:00			34		59			19:00			33		73		
07:15			39		49			19:15			27		39		
07:30			29		67			19:30			17		41		
07:45			41	143	72	247	390	19:45			14	91	28	181	272
08:00			48		61			20:00			11		30		
08:15			46		86			20:15			4		12		
08:30			40		73			20:30			10		21		
08:45			46	180	69	289	469	20:45			9	34	14	77	111
09:00			43		86			21:00			12		18		
09:15			38		64			21:15			6		22		
09:30			35		71			21:30			5		20		
09:45			21	137	55	276	413	21:45			8	31	30	90	121
10:00			29		70			22:00			5		36		
10:15			22		42			22:15			3		4		
10:30			28		54			22:30			2		1		
10:45			30	109	53	219	328	22:45			1	11	0	41	52
11:00			24		87			23:00			1		1		
11:15			38		76			23:15			1		3		
11:30			43		88			23:30			3		2		
11:45			45	150	109	360	510	23:45			3	8	3	9	17
Total Vol.				890		1636	**2526**					1509		2223	**3732**

Daily Totals

NB	SB	EB	WB	**Combined**
		2399	3859	**6258**

	AM			**PM**		
Split %	35.2%	64.8%	**40.4%**	40.4%	59.6%	**59.6%**
Peak Hour	11:45	11:30	**11:30**	16:45	12:00	**16:45**
Volume	224	379	**589**	303	335	**598**
P.H.F.	0.88	0.87	**0.90**	0.77	0.84	**0.90**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-005

Location: Ruffin Ct. btwn. Ruffin Rd. & County Office Dwy.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			42		59		
00:15			4		1			12:15			33		38		
00:30			0		2			12:30			42		35		
00:45			0	4	2	5	9	12:45			38	155	48	180	335
01:00			1		1			13:00			39		40		
01:15			1		0			13:15			46		32		
01:30			0		1			13:30			43		25		
01:45			1	3	0	2	5	13:45			31	159	21	118	277
02:00			0		0			14:00			27		35		
02:15			1		0			14:15			30		43		
02:30			0		0			14:30			42		40		
02:45			1	2	0	0	2	14:45			34	133	39	157	290
03:00			0		1			15:00			28		51		
03:15			0		0			15:15			32		40		
03:30			1		2			15:30			43		64		
03:45			0	1	1	4	5	15:45			19	122	37	192	314
04:00			4		1			16:00			29		55		
04:15			2		3			16:15			17		56		
04:30			0		1			16:30			25		58		
04:45			4	10	2	7	17	16:45			23	94	40	209	303
05:00			4		7			17:00			17		66		
05:15			9		4			17:15			23		49		
05:30			20		10			17:30			15		32		
05:45			23	56	15	36	92	17:45			17	72	29	176	248
06:00			17		9			18:00			11		38		
06:15			26		7			18:15			3		16		
06:30			31		13			18:30			8		14		
06:45			48	122	11	40	162	18:45			7	29	11	79	108
07:00			41		22			19:00			3		16		
07:15			57		27			19:15			16		7		
07:30			61		19			19:30			15		10		
07:45			63	222	23	91	313	19:45			9	43	4	37	80
08:00			43		25			20:00			2		17		
08:15			46		15			20:15			2		7		
08:30			38		17			20:30			0		4		
08:45			28	155	15	72	227	20:45			2	6	5	33	39
09:00			31		13			21:00			4		8		
09:15			26		19			21:15			2		14		
09:30			19		21			21:30			3		6		
09:45			19	95	16	69	164	21:45			2	11	1	29	40
10:00			23		27			22:00			1		7		
10:15			23		13			22:15			1		3		
10:30			24		16			22:30			13		5		
10:45			30	100	28	84	184	22:45			2	17	2	17	34
11:00			22		48			23:00			13		1		
11:15			37		24			23:15			1		3		
11:30			31		59			23:30			0		2		
11:45			36	126	50	181	307	23:45			3	17	2	8	25
Total Vol.				896		591	**1487**					858		1235	**2093**

Daily Totals

NB	SB	EB	WB	**Combined**
		1754	1826	**3580**

	AM			**PM**		
Split %	60.3%	39.7%	**41.5%**	41.0%	59.0%	**58.5%**
Peak Hour	07:15	11:30	**11:30**	12:45	16:15	**12:00**
Volume	224	206	**348**	166	220	**335**
P.H.F.	0.89	0.87	**0.86**	0.90	0.83	**0.83**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-013

Location: Balboa Ave. btwn. Ponderosa Ave. & Ruffin Rd.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			10		10			12:00			218		282		
00:15			7		3			12:15			203		207		
00:30			8		5			12:30			207		226		
00:45			11	36	4	22	58	12:45			235	863	227	942	1805
01:00			2		7			13:00			260		204		
01:15			3		4			13:15			224		186		
01:30			2		9			13:30			178		188		
01:45			6	13	5	25	38	13:45			211	873	183	761	1634
02:00			4		3			14:00			209		171		
02:15			4		3			14:15			170		173		
02:30			2		7			14:30			208		204		
02:45			1	11	14	27	38	14:45			217	804	174	722	1526
03:00			2		5			15:00			240		170		
03:15			1		9			15:15			193		149		
03:30			1		5			15:30			275		177		
03:45			12	16	22	41	57	15:45			222	930	185	681	1611
04:00			12		27			16:00			280		213		
04:15			10		24			16:15			297		183		
04:30			13		28			16:30			255		303		
04:45			11	46	37	116	162	16:45			244	1076	246	945	2021
05:00			8		41			17:00			281		259		
05:15			13		73			17:15			283		278		
05:30			18		80			17:30			288		218		
05:45			26	65	126	320	385	17:45			188	1040	195	950	1990
06:00			28		91			18:00			138		175		
06:15			23		134			18:15			96		136		
06:30			40		154			18:30			81		109		
06:45			62	153	235	614	767	18:45			52	367	84	504	871
07:00			141		236			19:00			65		72		
07:15			172		220			19:15			53		91		
07:30			191		271			19:30			61		63		
07:45			217	721	275	1002	1723	19:45			54	233	58	284	517
08:00			209		338			20:00			42		51		
08:15			175		273			20:15			34		36		
08:30			181		264			20:30			46		38		
08:45			171	736	204	1079	1815	20:45			45	167	37	162	329
09:00			149		179			21:00			62		25		
09:15			125		167			21:15			32		41		
09:30			93		136			21:30			55		29		
09:45			89	456	178	660	1116	21:45			23	172	25	120	292
10:00			98		137			22:00			33		36		
10:15			118		161			22:15			17		12		
10:30			124		143			22:30			23		22		
10:45			106	446	143	584	1030	22:45			23	96	14	84	180
11:00			155		187			23:00			9		16		
11:15			190		211			23:15			16		19		
11:30			197		265			23:30			18		22		
11:45			227	769	216	879	1648	23:45			18	61	7	64	125
Total Vol.				3468		5369	**8837**					6682		6219	**12901**

Daily Totals

NB	SB	EB	WB	**Combined**
		10150	11588	**21738**

	AM			**PM**		
Split %	39.2%	60.8%	**40.7%**	51.8%	48.2%	**59.3%**
Peak Hour	11:45	07:30	**07:30**	16:45	16:30	**16:30**
Volume	855	1157	**1949**	1096	1086	**2149**
P.H.F.	0.94	0.86	**0.89**	0.95	0.90	**0.96**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-014

Location: Balboa Ave. btwn. Ruffin Rd. & Viewridge Ave.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			22		3			12:00			195		180		
00:15			15		5			12:15			125		201		
00:30			15		5			12:30			160		220		
00:45			10	62	1	14	76	12:45			155	635	225	826	1461
01:00			15		5			13:00			187		184		
01:15			7		3			13:15			173		201		
01:30			20		2			13:30			152		191		
01:45			13	55	9	19	74	13:45			140	652	180	756	1408
02:00			3		5			14:00			167		154		
02:15			4		6			14:15			173		138		
02:30			1		6			14:30			254		156		
02:45			5	13	16	33	46	14:45			227	821	164	612	1433
03:00			6		14			15:00			246		143		
03:15			2		14			15:15			191		121		
03:30			5		33			15:30			322		111		
03:45			6	19	72	133	152	15:45			254	1013	134	509	1522
04:00			8		89			16:00			391		149		
04:15			7		88			16:15			377		138		
04:30			5		44			16:30			444		184		
04:45			7	27	78	299	326	16:45			435	1647	161	632	2279
05:00			8		80			17:00			453		182		
05:15			6		151			17:15			520		214		
05:30			23		212			17:30			466		156		
05:45			26	63	279	722	785	17:45			351	1790	161	713	2503
06:00			28		182			18:00			271		136		
06:15			25		273			18:15			205		107		
06:30			39		280			18:30			159		88		
06:45			51	143	439	1174	1317	18:45			140	775	73	404	1179
07:00			85		472			19:00			145		58		
07:15			71		475			19:15			107		64		
07:30			81		524			19:30			115		47		
07:45			102	339	559	2030	2369	19:45			109	476	44	213	689
08:00			96		569			20:00			76		43		
08:15			91		506			20:15			66		31		
08:30			96		453			20:30			88		36		
08:45			93	376	396	1924	2300	20:45			67	297	31	141	438
09:00			87		296			21:00			83		29		
09:15			76		239			21:15			81		35		
09:30			84		190			21:30			74		18		
09:45			81	328	197	922	1250	21:45			55	293	21	103	396
10:00			104		154			22:00			76		26		
10:15			112		146			22:15			27		17		
10:30			93		132			22:30			29		14		
10:45			114	423	148	580	1003	22:45			29	161	16	73	234
11:00			148		145			23:00			26		13		
11:15			140		176			23:15			14		16		
11:30			194		186			23:30			47		13		
11:45			202	684	183	690	1374	23:45			26	113	8	50	163
Total Vol.				2532		8540	**11072**					8673		5032	**13705**

Daily Totals

NB	SB	EB	WB	**Combined**
		11205	13572	**24777**

	AM			**PM**		
Split %	22.9%	77.1%	**44.7%**	63.3%	36.7%	**55.3%**
Peak Hour	11:15	07:30	**07:30**	16:45	12:15	**16:30**
Volume	731	2158	**2528**	1874	830	**2593**
P.H.F.	0.90	0.95	**0.95**	0.90	0.92	**0.88**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-015

Location: Balboa Ave. btwn. Viewridge Ave. & I-15

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			45		2			12:00			281		191		
00:15			23		4			12:15			219		232		
00:30			47		2			12:30			226		263		
00:45			15	130	0	8	138	12:45			188	914	265	951	1865
01:00			27		4			13:00			243		226		
01:15			10		2			13:15			235		222		
01:30			33		2			13:30			223		232		
01:45			18	88	7	15	103	13:45			227	928	236	916	1844
02:00			5		3			14:00			303		195		
02:15			9		5			14:15			257		200		
02:30			3		6			14:30			516		197		
02:45			7	24	13	27	51	14:45			334	1410	186	778	2188
03:00			16		11			15:00			517		158		
03:15			7		11			15:15			319		163		
03:30			5		31			15:30			552		137		
03:45			6	34	69	122	156	15:45			519	1907	145	603	2510
04:00			7		83			16:00			591		157		
04:15			12		81			16:15			543		152		
04:30			8		35			16:30			668		184		
04:45			9	36	63	262	298	16:45			605	2407	170	663	3070
05:00			17		72			17:00			699		187		
05:15			16		162			17:15			661		200		
05:30			34		208			17:30			663		178		
05:45			38	105	300	742	847	17:45			456	2479	168	733	3212
06:00			49		205			18:00			437		134		
06:15			44		293			18:15			296		107		
06:30			53		298			18:30			258		88		
06:45			47	193	486	1282	1475	18:45			195	1186	64	393	1579
07:00			93		666			19:00			196		53		
07:15			85		681			19:15			161		57		
07:30			104		625			19:30			183		49		
07:45			86	368	840	2812	3180	19:45			183	723	39	198	921
08:00			93		805			20:00			143		38		
08:15			110		644			20:15			90		27		
08:30			108		554			20:30			126		32		
08:45			106	417	510	2513	2930	20:45			112	471	28	125	596
09:00			125		425			21:00			112		25		
09:15			130		350			21:15			112		28		
09:30			118		279			21:30			111		17		
09:45			129	502	219	1273	1775	21:45			85	420	19	89	509
10:00			154		170			22:00			119		23		
10:15			177		154			22:15			41		21		
10:30			162		133			22:30			50		13		
10:45			155	648	165	622	1270	22:45			40	250	15	72	322
11:00			240		160			23:00			86		10		
11:15			216		189			23:15			27		15		
11:30			248		190			23:30			102		7		
11:45			291	995	180	719	1714	23:45			49	264	10	42	306
Total Vol.				3540		10397	**13937**					13359		5563	**18922**

Daily Totals

NB	SB	EB	WB	**Combined**
		16899	15960	**32859**

	AM			**PM**		
Split %	25.4%	74.6%	**42.4%**	70.6%	29.4%	**57.6%**
Peak Hour	11:30	07:15	**07:15**	16:30	12:15	**16:30**
Volume	1039	2951	**3319**	2633	986	**3374**
P.H.F.	0.89	0.88	**0.90**	0.94	0.93	**0.95**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-006

Location: Viewridge Ave. south of Ruffin Ct.

AM Period	NB		SB		EB		WB		PM Period	NB		SB		EB		WB	
00:00	0		0						12:00	26		27					
00:15	0		2						12:15	33		28					
00:30	1		2						12:30	21		31					
00:45	2	3	0	4				7	12:45	34	114	18	104				218
01:00	0		1						13:00	33		25					
01:15	0		1						13:15	30		29					
01:30	1		1						13:30	27		35					
01:45	0	1	2	5				6	13:45	29	119	25	114				233
02:00	0		0						14:00	22		35					
02:15	1		1						14:15	25		29					
02:30	0		0						14:30	24		82					
02:45	0	1	3	4				5	14:45	26	97	29	175				272
03:00	0		0						15:00	30		28					
03:15	0		0						15:15	29		18					
03:30	2		0						15:30	28		51					
03:45	1	3	1	1				4	15:45	21	108	30	127				235
04:00	2		0						16:00	25		42					
04:15	2		2						16:15	33		26					
04:30	2		0						16:30	24		33					
04:45	3	9	0	2				11	16:45	18	100	33	134				234
05:00	9		2						17:00	26		34					
05:15	11		1						17:15	22		24					
05:30	21		8						17:30	21		15					
05:45	55	96	9	20				116	17:45	10	79	15	88				167
06:00	23		23						18:00	9		14					
06:15	20		15						18:15	7		5					
06:30	40		11						18:30	8		14					
06:45	46	129	14	63				192	18:45	5	29	13	46				75
07:00	59		11						19:00	9		7					
07:15	48		22						19:15	5		14					
07:30	42		19						19:30	6		12					
07:45	47	196	17	69				265	19:45	1	21	10	43				64
08:00	53		15						20:00	4		5					
08:15	45		17						20:15	5		3					
08:30	30		15						20:30	1		0					
08:45	38	166	24	71				237	20:45	4	14	3	11				25
09:00	26		12						21:00	8		1					
09:15	20		18						21:15	12		1					
09:30	19		13						21:30	6		1					
09:45	14	79	12	55				134	21:45	14	40	2	5				45
10:00	17		12						22:00	2		9					
10:15	13		15						22:15	1		6					
10:30	10		19						22:30	0		14					
10:45	21	61	16	62				123	22:45	1	4	3	32				36
11:00	35		12						23:00	2		13					
11:15	19		29						23:15	2		3					
11:30	23		24						23:30	2		6					
11:45	24	101	26	91				192	23:45	1	7	6	28				35
Total Vol.		845		447				**1292**			732		907				**1639**

Daily Totals

NB	SB	EB	WB	**Combined**
1577	1354			**2931**

	AM			**PM**		
Split %	65.4%	34.6%	**44.1%**	44.7%	55.3%	**55.9%**
Peak Hour	07:00	11:45	**07:00**	12:45	14:00	**14:15**
Volume	196	112	**265**	124	175	**273**
P.H.F.	0.83	0.90	**0.95**	0.91	0.53	**0.64**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-007

Location: Viewridge Ave. north of Balboa Ave.

AM Period	NB		SB		EB		WB		PM Period	NB		SB		EB		WB	
00:00	0		0						12:00	36		55					
00:15	1		3						12:15	32		44					
00:30	0		1						12:30	40		36					
00:45	1	2	0	4				6	12:45	52	160	28	163				323
01:00	0		2						13:00	46		40					
01:15	0		2						13:15	42		31					
01:30	1		2						13:30	45		38					
01:45	1	2	2	8				10	13:45	39	172	35	144				316
02:00	1		1						14:00	42		43					
02:15	1		1						14:15	45		33					
02:30	3		0						14:30	32		113					
02:45	1	6	3	5				11	14:45	44	163	45	234				397
03:00	2		2						15:00	40		64					
03:15	2		0						15:15	40		48					
03:30	5		0						15:30	40		93					
03:45	5	14	2	4				18	15:45	36	156	56	261				417
04:00	2		1						16:00	32		92					
04:15	6		2						16:15	33		54					
04:30	8		2						16:30	33		76					
04:45	16	32	0	5				37	16:45	37	135	82	304				439
05:00	15		2						17:00	18		98					
05:15	21		2						17:15	26		60					
05:30	31		7						17:30	16		68					
05:45	89	156	5	16				172	17:45	10	70	48	274				344
06:00	49		20						18:00	7		52					
06:15	54		13						18:15	6		25					
06:30	81		5						18:30	9		28					
06:45	102	286	9	47				333	18:45	8	30	26	131				161
07:00	86		9						19:00	8		33					
07:15	97		15						19:15	10		22					
07:30	81		16						19:30	16		16					
07:45	109	373	22	62				435	19:45	12	46	13	84				130
08:00	118		24						20:00	3		28					
08:15	102		25						20:15	7		24					
08:30	90		14						20:30	5		11					
08:45	78	388	38	101				489	20:45	5	20	5	68				88
09:00	59		12						21:00	3		26					
09:15	41		22						21:15	2		23					
09:30	39		19						21:30	6		9					
09:45	36	175	28	81				256	21:45	12	23	10	68				91
10:00	28		18						22:00	2		9					
10:15	35		13						22:15	0		9					
10:30	16		28						22:30	0		15					
10:45	36	115	24	83				198	22:45	0	2	4	37				39
11:00	33		28						23:00	3		15					
11:15	20		37						23:15	3		1					
11:30	24		34						23:30	1		10					
11:45	35	112	38	137				249	23:45	0	7	6	32				39
Total Vol.		1661		553				**2214**			984		1800				**2784**

Daily Totals

NB	SB	EB	WB	**Combined**
2645	2353			**4998**

	AM			**PM**		
Split %	75.0%	25.0%	**44.3%**	35.3%	64.7%	**55.7%**
Peak Hour	07:45	11:45	**07:45**	12:45	16:30	**16:00**
Volume	419	173	**504**	185	316	**439**
P.H.F.	0.89	0.79	**0.89**	0.89	0.81	**0.89**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-006

Location: Ruffin Rd. btwn. SR-52 & Kearny Villa Rd.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	3		4					12:00	113		159				
00:15	1		6					12:15	110		163				
00:30	9		3					12:30	111		188				
00:45	17	30	1	14			44	12:45	119	453	256	766			1219
01:00	5		2					13:00	103		170				
01:15	2		6					13:15	167		192				
01:30	3		3					13:30	191		195				
01:45	4	14	7	18			32	13:45	178	639	211	768			1407
02:00	3		2					14:00	206		149				
02:15	1		7					14:15	202		172				
02:30	8		4					14:30	218		183				
02:45	2	14	5	18			32	14:45	222	848	152	656			1504
03:00	4		5					15:00	208		167				
03:15	1		1					15:15	328		160				
03:30	2		10					15:30	355		168				
03:45	1	8	13	29			37	15:45	354	1245	172	667			1912
04:00	1		10					16:00	444		139				
04:15	2		14					16:15	327		147				
04:30	4		22					16:30	366		139				
04:45	3	10	47	93			103	16:45	333	1470	158	583			2053
05:00	3		43					17:00	417		143				
05:15	7		69					17:15	334		147				
05:30	10		93					17:30	317		152				
05:45	13	33	135	340			373	17:45	281	1349	114	556			1905
06:00	15		154					18:00	239		82				
06:15	25		201					18:15	187		66				
06:30	32		225					18:30	155		52				
06:45	44	116	215	795			911	18:45	154	735	52	252			987
07:00	68		232					19:00	141		29				
07:15	78		309					19:15	128		30				
07:30	93		291					19:30	78		28				
07:45	80	319	206	1038			1357	19:45	80	427	29	116			543
08:00	76		231					20:00	87		23				
08:15	80		249					20:15	75		23				
08:30	86		326					20:30	75		15				
08:45	87	329	305	1111			1440	20:45	63	300	21	82			382
09:00	100		268					21:00	24		13				
09:15	118		208					21:15	21		14				
09:30	107		198					21:30	14		18				
09:45	117	442	216	890			1332	21:45	19	78	11	56			134
10:00	115		121					22:00	16		11				
10:15	121		150					22:15	9		8				
10:30	108		138					22:30	14		9				
10:45	115	459	159	568			1027	22:45	7	46	11	39			85
11:00	120		145					23:00	7		5				
11:15	128		175					23:15	9		8				
11:30	150		175					23:30	11		5				
11:45	123	521	203	698			1219	23:45	6	33	3	21			54
Total Vol.		2295		5612			**7907**			7623		4562			**12185**

Daily Totals

NB	SB	EB	WB	**Combined**
9918	10174			**20092**

	AM			**PM**		
Split %	29.0%	71.0%	**39.4%**	62.6%	37.4%	**60.6%**
Peak Hour	11:00	08:15	**08:15**	15:45	12:45	**15:15**
Volume	521	1148	**1501**	1491	813	**2120**
P.H.F.	0.87	0.88	**0.91**	0.84	0.79	**0.91**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-007

Location: Ruffin Rd. btwn. Kearny Villa Rd. & Chesapeake Dr.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	8		4					12:00	126		114				
00:15	1		5					12:15	111		121				
00:30	23		3					12:30	124		127				
00:45	28	60	2	14			74	12:45	136	497	154	516			1013
01:00	10		1					13:00	104		122				
01:15	7		0					13:15	114		122				
01:30	4		4					13:30	124		127				
01:45	5	26	6	11			37	13:45	119	461	140	511			972
02:00	4		3					14:00	133		114				
02:15	1		5					14:15	129		116				
02:30	7		6					14:30	167		134				
02:45	2	14	3	17			31	14:45	156	585	111	475			1060
03:00	2		3					15:00	188		116				
03:15	1		1					15:15	158		118				
03:30	4		9					15:30	270		123				
03:45	4	11	13	26			37	15:45	212	828	117	474			1302
04:00	5		9					16:00	309		115				
04:15	2		13					16:15	216		123				
04:30	5		18					16:30	311		121				
04:45	8	20	40	80			100	16:45	291	1127	135	494			1621
05:00	8		30					17:00	352		149				
05:15	15		56					17:15	284		134				
05:30	24		62					17:30	259		131				
05:45	34	81	83	231			312	17:45	205	1100	104	518			1618
06:00	35		109					18:00	209		76				
06:15	43		142					18:15	136		48				
06:30	60		166					18:30	104		44				
06:45	74	212	192	609			821	18:45	79	528	34	202			730
07:00	77		185					19:00	75		28				
07:15	85		233					19:15	65		30				
07:30	90		229					19:30	41		22				
07:45	84	336	170	817			1153	19:45	39	220	24	104			324
08:00	92		155					20:00	46		19				
08:15	73		185					20:15	30		17				
08:30	83		224					20:30	24		16				
08:45	72	320	225	789			1109	20:45	43	143	16	68			211
09:00	73		176					21:00	30		11				
09:15	99		151					21:15	31		8				
09:30	100		128					21:30	20		16				
09:45	93	365	146	601			966	21:45	37	118	9	44			162
10:00	94		92					22:00	25		10				
10:15	108		104					22:15	19		7				
10:30	91		103					22:30	29		9				
10:45	103	396	118	417			813	22:45	13	86	4	30			116
11:00	115		106					23:00	8		6				
11:15	121		118					23:15	14		6				
11:30	148		148					23:30	15		5				
11:45	126	510	155	527			1037	23:45	12	49	3	20			69
Total Vol.		2351		4139			**6490**			5742		3456			**9198**

Daily Totals

NB	SB	EB	WB	**Combined**
8093	7595			**15688**

	AM			**PM**		
Split %	36.2%	63.8%	**41.4%**	62.4%	37.6%	**58.6%**
Peak Hour	11:15	06:45	**06:45**	16:30	16:45	**16:30**
Volume	521	839	**1165**	1238	549	**1777**
P.H.F.	0.88	0.90	**0.91**	0.88	0.92	**0.89**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Wednesday, January 11, 2012 City: San Diego Project #: 12-1004-008

Location: Ruffin Rd. btwn. Chesapeake Dr. & Clairemont Mesa Blvd.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	6		9					12:00	126		126				
00:15	3		9					12:15	115		126				
00:30	9		37					12:30	111		142				
00:45	0	18	45	100			118	12:45	141	493	145	539			1032
01:00	6		8					13:00	100		140				
01:15	4		6					13:15	117		148				
01:30	2		10					13:30	104		115				
01:45	5	17	13	37			54	13:45	128	449	148	551			1000
02:00	0		8					14:00	115		120				
02:15	2		3					14:15	103		125				
02:30	1		18					14:30	162		137				
02:45	0	3	5	34			37	14:45	139	519	116	498			1017
03:00	1		10					15:00	172		124				
03:15	1		2					15:15	134		135				
03:30	3		8					15:30	197		173				
03:45	1	6	15	35			41	15:45	158	661	174	606			1267
04:00	7		8					16:00	228		188				
04:15	1		14					16:15	153		176				
04:30	5		11					16:30	237		206				
04:45	10	23	29	62			85	16:45	215	833	191	761			1594
05:00	13		25					17:00	248		214				
05:15	12		50					17:15	239		187				
05:30	19		49					17:30	206		193				
05:45	37	81	61	185			266	17:45	140	833	162	756			1589
06:00	33		88					18:00	146		138				
06:15	59		112					18:15	94		103				
06:30	53		137					18:30	80		101				
06:45	82	227	145	482			709	18:45	59	379	65	407			786
07:00	97		152					19:00	52		44				
07:15	105		181					19:15	32		38				
07:30	128		179					19:30	36		32				
07:45	105	435	136	648			1083	19:45	34	154	25	139			293
08:00	116		110					20:00	47		38				
08:15	109		139					20:15	33		23				
08:30	106		175					20:30	28		17				
08:45	114	445	176	600			1045	20:45	37	145	17	95			240
09:00	117		142					21:00	23		17				
09:15	94		144					21:15	23		11				
09:30	100		127					21:30	20		17				
09:45	90	401	129	542			943	21:45	34	100	9	54			154
10:00	83		93					22:00	21		17				
10:15	96		99					22:15	19		11				
10:30	87		96					22:30	28		12				
10:45	111	377	123	411			788	22:45	10	78	10	50			128
11:00	106		129					23:00	10		4				
11:15	121		124					23:15	9		8				
11:30	129		156					23:30	10		9				
11:45	127	483	160	569			1052	23:45	6	35	9	30			65
Total Vol.		2516		3705			**6221**			4679		4486			**9165**

Daily Totals

NB	SB	EB	WB	**Combined**
7195	8191			**15386**

	AM			**PM**		
Split %	40.4%	59.6%	**40.4%**	51.1%	48.9%	**59.6%**
Peak Hour	11:15	06:45	**07:00**	16:30	16:30	**16:30**
Volume	503	657	**1083**	939	798	**1737**
P.H.F.	0.97	0.91	**0.88**	0.95	0.93	**0.94**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-003

Location: Ruffin Rd. btwn. Hazard Way & Farnham St.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	13		13					12:00	139		152				
00:15	3		9					12:15	144		131				
00:30	4		41					12:30	112		146				
00:45	6	26	21	84			110	12:45	114	509	149	578			1087
01:00	8		18					13:00	131		129				
01:15	5		7					13:15	109		129				
01:30	3		13					13:30	105		116				
01:45	4	20	10	48			68	13:45	125	470	112	486			956
02:00	7		9					14:00	118		130				
02:15	0		5					14:15	109		117				
02:30	0		19					14:30	138		139				
02:45	5	12	9	42			54	14:45	136	501	145	531			1032
03:00	0		6					15:00	172		155				
03:15	5		9					15:15	119		113				
03:30	4		5					15:30	159		206				
03:45	8	17	9	29			46	15:45	146	596	163	637			1233
04:00	7		8					16:00	191		179				
04:15	2		13					16:15	154		152				
04:30	9		6					16:30	192		208				
04:45	11	29	21	48			77	16:45	174	711	177	716			1427
05:00	10		30					17:00	243		211				
05:15	19		27					17:15	233		163				
05:30	27		45					17:30	176		153				
05:45	57	113	77	179			292	17:45	115	767	125	652			1419
06:00	51		84					18:00	124		122				
06:15	59		91					18:15	84		77				
06:30	81		86					18:30	70		64				
06:45	99	290	119	380			670	18:45	65	343	76	339			682
07:00	88		114					19:00	55		56				
07:15	112		171					19:15	39		39				
07:30	101		173					19:30	42		34				
07:45	110	411	179	637			1048	19:45	39	175	29	158			333
08:00	106		188					20:00	32		39				
08:15	89		175					20:15	35		34				
08:30	93		137					20:30	22		36				
08:45	93	381	155	655			1036	20:45	36	125	32	141			266
09:00	98		125					21:00	22		20				
09:15	69		111					21:15	28		25				
09:30	92		126					21:30	22		10				
09:45	74	333	88	450			783	21:45	27	99	9	64			163
10:00	87		92					22:00	27		16				
10:15	75		99					22:15	17		9				
10:30	108		112					22:30	14		19				
10:45	95	365	115	418			783	22:45	14	72	12	56			128
11:00	121		147					23:00	10		18				
11:15	114		156					23:15	13		7				
11:30	118		132					23:30	13		4				
11:45	129	482	132	567			1049	23:45	8	44	10	39			83
Total Vol.		2479		3537			**6016**			4412		4397			**8809**

Daily Totals

NB	SB	EB	WB	**Combined**
6891	7934			**14825**

	AM			**PM**		
Split %	41.2%	58.8%	**40.6%**	50.1%	49.9%	**59.4%**
Peak Hour	11:30	07:30	**07:15**	16:30	16:30	**16:30**
Volume	530	715	**1140**	842	759	**1601**
P.H.F.	0.92	0.95	**0.97**	0.87	0.90	**0.88**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 10, 2012 City: San Diego Project #: 12-1079-004

Location: Ruffin Rd. btwn. Farnham St. & Clairemont Mesa Blvd.

AM Period	NB		SB		EB		WB		PM Period	NB		SB		EB		WB	
00:00	12		14						12:00	169		205					
00:15	3		9						12:15	145		167					
00:30	3		37						12:30	172		203					
00:45	8	26	19	79				105	12:45	175	661	176	751				1412
01:00	6		20						13:00	178		151					
01:15	6		8						13:15	137		161					
01:30	5		13						13:30	140		146					
01:45	6	23	9	50				73	13:45	156	611	126	584				1195
02:00	7		9						14:00	140		160					
02:15	0		5						14:15	116		152					
02:30	6		18						14:30	152		158					
02:45	5	18	8	40				58	14:45	150	558	182	652				1210
03:00	2		5						15:00	151		211					
03:15	7		11						15:15	123		146					
03:30	4		5						15:30	177		232					
03:45	10	23	9	30				53	15:45	130	581	181	770				1351
04:00	5		8						16:00	192		238					
04:15	6		9						16:15	150		188					
04:30	11		10						16:30	157		265					
04:45	12	34	14	41				75	16:45	173	672	228	919				1591
05:00	16		19						17:00	227		281					
05:15	22		22						17:15	221		224					
05:30	29		37						17:30	157		205					
05:45	81	148	64	142				290	17:45	113	718	166	876				1594
06:00	79		63						18:00	104		146					
06:15	91		74						18:15	81		83					
06:30	113		74						18:30	58		77					
06:45	147	430	110	321				751	18:45	59	302	82	388				690
07:00	162		99						19:00	52		72					
07:15	151		143						19:15	36		41					
07:30	147		174						19:30	39		37					
07:45	154	614	145	561				1175	19:45	36	163	34	184				347
08:00	169		169						20:00	32		41					
08:15	127		156						20:15	33		39					
08:30	154		143						20:30	19		35					
08:45	153	603	141	609				1212	20:45	36	120	37	152				272
09:00	109		129						21:00	22		26					
09:15	109		120						21:15	26		27					
09:30	100		136						21:30	24		16					
09:45	105	423	101	486				909	21:45	26	98	12	81				179
10:00	93		102						22:00	24		19					
10:15	87		135						22:15	16		11					
10:30	115		134						22:30	15		17					
10:45	109	404	129	500				904	22:45	11	66	11	58				124
11:00	138		172						23:00	10		19					
11:15	133		180						23:15	12		7					
11:30	129		165						23:30	12		6					
11:45	150	550	167	684				1234	23:45	10	44	13	45				89
Total Vol.		3296		3543				**6839**			4594		5460				**10054**

Daily Totals

NB	SB	EB	WB	**Combined**
7890	9003			**16893**

	AM			**PM**		
Split %	48.2%	51.8%	**40.5%**	45.7%	54.3%	**59.5%**
Peak Hour	11:45	11:45	**11:45**	16:30	16:30	**16:30**
Volume	636	742	**1378**	778	998	**1776**
P.H.F.	0.92	0.90	**0.92**	0.86	0.89	**0.87**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-009

Location: Ruffin Rd. btwn. Clairemont Mesa Blvd. & Project Access #2 (South)

AM Period	NB		SB		EB		WB		PM Period	NB		SB		EB		WB		
00:00	5		6						12:00	231		208						
00:15	3		3						12:15	201		225						
00:30	5		5						12:30	177		225						
00:45	12	25	2	16				41	12:45	171	780	265	923					1703
01:00	4		1						13:00	169		211						
01:15	2		3						13:15	175		236						
01:30	2		1						13:30	147		199						
01:45	6	14	3	8				22	13:45	141	632	180	826					1458
02:00	4		4						14:00	149		152						
02:15	5		1						14:15	138		123						
02:30	2		3						14:30	184		138						
02:45	3	14	3	11				25	14:45	120	591	124	537					1128
03:00	3		3						15:00	173		137						
03:15	3		6						15:15	171		123						
03:30	2		10						15:30	189		134						
03:45	5	13	7	26				39	15:45	167	700	165	559					1259
04:00	3		11						16:00	241		152						
04:15	3		5						16:15	216		175						
04:30	2		14						16:30	244		165						
04:45	5	13	22	52				65	16:45	197	898	193	685					1583
05:00	10		35						17:00	209		245						
05:15	7		55						17:15	223		272						
05:30	15		45						17:30	204		190						
05:45	11	43	84	219				262	17:45	139	775	153	860					1635
06:00	31		60						18:00	150		123						
06:15	34		124						18:15	109		114						
06:30	56		141						18:30	82		72						
06:45	50	171	169	494				665	18:45	73	414	62	371					785
07:00	64		177						19:00	85		56						
07:15	88		215						19:15	69		64						
07:30	77		236						19:30	65		65						
07:45	98	327	263	891				1218	19:45	48	267	51	236					503
08:00	99		242						20:00	36		24						
08:15	93		238						20:15	19		27						
08:30	88		220						20:30	29		26						
08:45	79	359	223	923				1282	20:45	49	133	21	98					231
09:00	100		200						21:00	43		20						
09:15	87		176						21:15	28		12						
09:30	89		166						21:30	33		19						
09:45	108	384	149	691				1075	21:45	62	166	16	67					233
10:00	103		117						22:00	63		17						
10:15	97		114						22:15	23		6						
10:30	133		121						22:30	18		9						
10:45	117	450	129	481				931	22:45	12	116	9	41					157
11:00	142		142						23:00	9		4						
11:15	183		169						23:15	5		5						
11:30	219		168						23:30	6		8						
11:45	203	747	215	694				1441	23:45	4	24	2	19					43
Total Vol.		2560		4506				**7066**			5496		5222					**10718**

Daily Totals

NB	SB	EB	WB	**Combined**
8056	9728			**17784**

	AM			**PM**		
Split %	36.2%	63.8%	**39.7%**	51.3%	48.7%	**60.3%**
Peak Hour	11:30	07:30	**11:45**	16:00	12:30	**16:30**
Volume	854	979	**1685**	898	937	**1748**
P.H.F.	0.92	0.93	**0.96**	0.92	0.88	**0.88**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-010

Location: Ruffin Rd. btwn. Project Access #2 (South) & Ruffin Ct.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	7		6					12:00	223		213				
00:15	3		3					12:15	221		220				
00:30	6		6					12:30	181		233				
00:45	13	29	1	16			45	12:45	190	815	254	920			1735
01:00	4		1					13:00	191		215				
01:15	2		3					13:15	171		234				
01:30	3		1					13:30	159		201				
01:45	5	14	3	8			22	13:45	152	673	170	820			1493
02:00	4		4					14:00	164		159				
02:15	6		1					14:15	152		121				
02:30	4		3					14:30	189		138				
02:45	3	17	4	12			29	14:45	144	649	132	550			1199
03:00	4		2					15:00	209		134				
03:15	2		7					15:15	176		123				
03:30	2		9					15:30	222		139				
03:45	5	13	8	26			39	15:45	194	801	156	552			1353
04:00	3		11					16:00	263		157				
04:15	3		5					16:15	226		179				
04:30	2		13					16:30	248		160				
04:45	5	13	22	51			64	16:45	227	964	193	689			1653
05:00	10		38					17:00	237		263				
05:15	11		56					17:15	246		259				
05:30	18		45					17:30	216		190				
05:45	11	50	83	222			272	17:45	154	853	153	865			1718
06:00	33		59					18:00	164		118				
06:15	34		122					18:15	117		121				
06:30	56		142					18:30	90		65				
06:45	58	181	174	497			678	18:45	78	449	58	362			811
07:00	77		186					19:00	101		55				
07:15	95		210					19:15	67		66				
07:30	91		235					19:30	75		65				
07:45	115	378	253	884			1262	19:45	51	294	49	235			529
08:00	112		246					20:00	42		27				
08:15	97		242					20:15	21		26				
08:30	101		215					20:30	35		28				
08:45	85	395	238	941			1336	20:45	55	153	19	100			253
09:00	101		186					21:00	45		22				
09:15	102		177					21:15	37		11				
09:30	89		173					21:30	35		21				
09:45	112	404	143	679			1083	21:45	67	184	17	71			255
10:00	117		120					22:00	72		16				
10:15	107		118					22:15	25		7				
10:30	134		115					22:30	23		8				
10:45	123	481	125	478			959	22:45	10	130	9	40			170
11:00	148		144					23:00	11		5				
11:15	186		169					23:15	4		4				
11:30	230		170					23:30	6		8				
11:45	205	769	218	701			1470	23:45	6	27	2	19			46
Total Vol.		2744		4515			**7259**			5992		5223			**11215**

Daily Totals

NB	SB	EB	WB	**Combined**
8736	9738			**18474**

	AM			**PM**		
Split %	37.8%	62.2%	**39.3%**	53.4%	46.6%	**60.7%**
Peak Hour	11:30	07:30	**11:45**	16:00	12:30	**16:30**
Volume	879	976	**1714**	964	936	**1833**
P.H.F.	0.96	0.96	**0.97**	0.92	0.92	**0.91**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-011

Location: Ruffin Rd. btwn. Ruffin Ct. & Spectrum Center Blvd.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	7		7					12:00	193		187				
00:15	0		3					12:15	190		167				
00:30	3		6					12:30	156		167				
00:45	12	22	5	21			43	12:45	170	709	191	712			1421
01:00	4		2					13:00	150		157				
01:15	1		2					13:15	128		172				
01:30	3		2					13:30	135		157				
01:45	4	12	3	9			21	13:45	121	534	149	635			1169
02:00	5		1					14:00	123		120				
02:15	5		2					14:15	107		110				
02:30	3		3					14:30	145		127				
02:45	2	15	5	11			26	14:45	115	490	102	459			949
03:00	3		4					15:00	151		119				
03:15	2		8					15:15	129		96				
03:30	1		12					15:30	141		122				
03:45	7	13	10	34			47	15:45	138	559	122	459			1018
04:00	8		11					16:00	168		166				
04:15	8		8					16:15	172		152				
04:30	8		14					16:30	169		183				
04:45	13	37	14	47			84	16:45	172	681	160	661			1342
05:00	18		11					17:00	169		231				
05:15	25		31					17:15	221		202				
05:30	29		35					17:30	155		198				
05:45	32	104	50	127			231	17:45	110	655	155	786			1441
06:00	28		33					18:00	88		125				
06:15	47		65					18:15	87		104				
06:30	75		89					18:30	54		77				
06:45	91	241	92	279			520	18:45	56	285	60	366			651
07:00	104		105					19:00	62		60				
07:15	115		114					19:15	47		63				
07:30	132		123					19:30	50		65				
07:45	145	496	153	495			991	19:45	38	197	49	237			434
08:00	156		110					20:00	16		38				
08:15	123		142					20:15	14		24				
08:30	137		110					20:30	17		42				
08:45	132	548	117	479			1027	20:45	18	65	41	145			210
09:00	133		107					21:00	20		42				
09:15	126		118					21:15	25		41				
09:30	87		106					21:30	12		40				
09:45	104	450	122	453			903	21:45	21	78	48	171			249
10:00	114		89					22:00	11		62				
10:15	103		103					22:15	8		9				
10:30	136		107					22:30	10		11				
10:45	117	470	105	404			874	22:45	9	38	11	93			131
11:00	127		120					23:00	10		3				
11:15	160		144					23:15	4		7				
11:30	187		162					23:30	3		8				
11:45	180	654	149	575			1229	23:45	5	22	5	23			45
Total Vol.		3062		2934			**5996**			4313		4747			**9060**

Daily Totals

NB	SB	EB	WB	**Combined**
7375	7681			**15056**

	AM			**PM**		
Split %	51.1%	48.9%	**39.8%**	47.6%	52.4%	**60.2%**
Peak Hour	11:30	11:45	**11:30**	16:30	16:45	**16:45**
Volume	750	670	**1415**	731	791	**1508**
P.H.F.	0.97	0.90	**0.93**	0.83	0.86	**0.89**

Field Data Services of Arizona, Inc.
(520) 316-6745

Volumes for: Thursday, January 12, 2012 City: San Diego Project #: 12-1004-012

Location: Ruffin Rd. btwn. Spectrum Center Blvd. & Balboa Ave.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	6		8					12:00	197		219				
00:15	3		4					12:15	202		187				
00:30	7		6					12:30	172		187				
00:45	8	24	6	24			48	12:45	191	762	215	808			1570
01:00	8		7					13:00	169		189				
01:15	1		3					13:15	144		179				
01:30	1		3					13:30	154		161				
01:45	8	18	8	21			39	13:45	139	606	162	691			1297
02:00	3		2					14:00	127		154				
02:15	6		3					14:15	106		131				
02:30	4		4					14:30	150		152				
02:45	5	18	4	13			31	14:45	107	490	140	577			1067
03:00	10		4					15:00	141		157				
03:15	8		8					15:15	120		129				
03:30	5		12					15:30	121		187				
03:45	7	30	10	34			64	15:45	131	513	165	638			1151
04:00	8		11					16:00	158		245				
04:15	19		13					16:15	180		207				
04:30	17		15					16:30	170		266				
04:45	26	70	11	50			120	16:45	166	674	229	947			1621
05:00	25		16					17:00	172		337				
05:15	38		25					17:15	235		282				
05:30	70		35					17:30	139		284				
05:45	68	201	45	121			322	17:45	108	654	223	1126			1780
06:00	59		40					18:00	86		202				
06:15	94		50					18:15	78		153				
06:30	129		74					18:30	46		114				
06:45	177	459	72	236			695	18:45	67	277	94	563			840
07:00	200		82					19:00	56		92				
07:15	226		87					19:15	54		79				
07:30	221		108					19:30	58		80				
07:45	301	948	127	404			1352	19:45	45	213	50	301			514
08:00	292		102					20:00	26		44				
08:15	228		131					20:15	18		31				
08:30	228		99					20:30	18		54				
08:45	200	948	111	443			1391	20:45	31	93	47	176			269
09:00	175		112					21:00	22		44				
09:15	162		109					21:15	35		46				
09:30	102		100					21:30	17		42				
09:45	112	551	130	451			1002	21:45	22	96	57	189			285
10:00	124		103					22:00	17		65				
10:15	104		106					22:15	11		14				
10:30	139		119					22:30	8		12				
10:45	129	496	112	440			936	22:45	10	46	11	102			148
11:00	132		139					23:00	9		5				
11:15	177		174					23:15	4		11				
11:30	198		181					23:30	5		12				
11:45	185	692	194	688			1380	23:45	9	27	13	41			68
Total Vol.		4455		2925			**7380**			4451		6159			**10610**

Daily Totals

NB	SB	EB	WB	**Combined**
8906	9084			**17990**

	AM			**PM**		
Split %	60.4%	39.6%	**41.0%**	42.0%	58.0%	**59.0%**
Peak Hour	07:45	11:45	**11:30**	12:00	16:45	**16:30**
Volume	1049	787	**1563**	762	1132	**1857**
P.H.F.	0.87	0.90	**0.94**	0.94	0.84	**0.90**

B – 4

FREEWAY VOLUMES FROM PEMS, K & D FACTORS AND TRUCK FACTORS

Freeway Volumes

	Northbound	Southbound	Total	Date
I-15				
Aero to Balboa	86,349	88,270	174,619	Jan 2012 - Dec 2012
Balboa to Clairemont Mesa	80,758	82,515	163,273	Jan 2012 - Dec 2012
Clairemont Mesa to SR 52	60,570	101,145	161,715	Jan 2012 - Dec 2012
SR 163				
Balboa to Clairemont Mesa	63,766	75,977	139,743	Jan 2012 - Dec 2012
Clairemont Mesa to SR 52	58,576	61,470	120,046	Jan 2012 - Dec 2012
	Eastbound	**Westbound**		
SR 52				
Jct. SR 163 to Kearny Villa	n/a	n/a		
Kearny Villa to I-15	28,016	36,932	64,948	Jan 2012 - Dec 2012

									AM PEAK							PM PEAK						
DI	RTE	CO	PRE	PM	CS	LEG	YR	Dir	1 WAY	%	%	%	HR	DAY	MNTH	Dir	1 WAY	%	%	%	HR	DAY	MNTH
11	015	SD	R	6.132	911	A	09	N	10185	8.36	61.45	5.14	7	THU	DEC	S	9259	8.25	56.62	4.67	16	THU	MAY
11	015	SD	M	12.12	912	A	07	S	12921	8.13	52.65	4.28	7	THU	MAR	S	12729	7.92	53.22	4.22	16	THU	AUG
11	015	SD	M	15	999	X	08	S	12113	8.28	57.23	4.74	7	WED	NOV	N	10625	7.5	55.41	4.16	17	MON	MAR
11	015	SD	M	15.92	913	B	08	S	12643	8.16	58.11	4.74	7	THU	MAY	N	11332	8.08	52.57	4.25	17	WED	APR
11	015	SD	M	20.57	980	B	09	S	9806	7.84	57.1	4.48	7	THU	MAY	N	8837	7.73	52.2	4.04	16	THU	SEP
11	015	SD	M	26.03	934	B	09	S	9576	7.58	62.98	4.78	7	MON	JAN	N	10191	8.54	59.49	5.08	17	FRI	FEB
11	015	SD	M	26.03	935	A	09	S	9968	7.57	62.81	4.75	7	THU	FEB	N	10835	8.32	62.12	5.17	16	MON	DEC
11	015	SD	R	31.52	915	A	09	S	6102	7.03	69.36	4.88	7	THU	SEP	N	6355	8.58	59.23	5.08	15	WED	DEC
11	015	SD	R	54.07	917	B	09	S	7463	7.33	78.22	5.73	6	MON	AUG	N	7078	8.1	67.1	5.44	16	THU	APR
11	015	SD	R	54.07	919	A	09	S	7292	7.19	78.02	5.61	6	TUE	FEB	N	6930	7.9	67.46	5.33	17	THU	FEB
08	015	SBD	R	20.01	809	B	07	S	7148	6.67	67.76	4.52	6	TUE	FEB	N	6681	6.49	65.09	4.23	17	WED	MAR
08	015	SBD		44.40	821	A	08	S	3225	9.68	59.44	5.75	12	SUN	MAR	S	3492	9.15	68.08	6.23	16	MON	FEB
08	015	SBD		70.10	515	B	08	N	3304	8.23	70.72	5.82	7	FRI	JUL	S	3449	9.61	63.24	6.08	13	SUN	MAR
08	015	SBD	R	81.83	604	B	09	N	2793	11.17	62.57	6.99	9	THU	NOV	N	2941	12.2	60.34	7.36	13	FRI	JUL
08	015	SBD	R	138.5	907	A	09	S	2784	12.12	60.77	7.36	11	SUN	JUL	N	2877	14.13	53.87	7.61	15	FRI	DEC
03	016	COL		0	100	A	09	E	47	13.24	56.63	7.5	12	SUN	APR	W	55	14.83	59.14	8.77	16	SAT	MAR
03	016	YOL		18.13	104	O	07	W	104	9.71	57.46	5.58	12	SUN	APR	W	170	17.49	52.15	9.12	15	SAT	OCT
03	016	YOL		25.15	332	O	07	E	504	4.93	85.28	4.2	2	SUN	DEC	W	626	7.91	65.96	5.22	17	FRI	NOV
03	016	YOL		31.87	103	B	07	W	562	5.67	68.79	3.9	11	MON	JAN	W	680	6.47	72.96	4.72	19	FRI	OCT
03	016	YOL		40.57	101	B	07	E	472	6.41	62.11	3.98	7	WED	OCT	W	578	9.06	53.77	4.87	17	FRI	APR
03	016	YOL	R	40.57	105	A	07	E	361	8.57	53.32	4.57	7	THU	OCT	E	389	9.18	53.66	4.92	17	THU	APR
03	016	SAC	T	1.955	112	A	08	E	500	6.75	63.45	4.28	6	MON	OCT	E	767	9.4	69.85	6.57	17	TUE	OCT
03	016	SAC	R	11.47	117	B	08	W	592	9.21	69.24	6.37	7	THU	APR	E	582	9.34	67.13	6.27	17	WED	MAR
03	016	SAC	R	11.47	118	A	08	W	730	7.89	72.13	5.69	7	WED	MAY	E	773	8.25	73.06	6.03	17	TUE	MAY
03	016	SAC	R	22.85	910	A	08	W	346	7.46	73.62	5.49	6	TUE	OCT	E	372	9.19	64.25	5.9	16	FRI	JUL
10	016	AMA		9.093	84	A	09	W	509	8.13	73.77	6	6	FRI	OCT	E	565	10.26	64.94	6.66	17	WED	NOV
10	016	AMA		9.093	129	B	09	E	438	10.59	57.33	6.07	12	SAT	NOV	E	490	10.43	65.16	6.79	17	WED	NOV
05	017	SCR		5.453	173	A	08	N	3520	7.47	84.6	6.32	6	FRI	DEC	N	2854	8.53	60.07	5.12	16	SAT	DEC
05	017	SCR		5.453	550	B	08	N	2729	6	80.27	4.82	6	THU	DEC	N	2781	8.3	59.16	4.91	16	SUN	JUN
01	020	LAK		.99	170	A	07	E	422	9.12	55.45	5.05	12	SAT	NOV	E	529	10.06	62.98	6.34	17	FRI	SEP
01	020	LAK		31.53	124	B	08	W	380	9.26	67.62	6.26	12	SAT	DEC	W	431	10.21	69.52	7.1	13	WED	DEC
01	020	LAK		31.67	125	A	08	E	429	10.33	61.29	6.33	12	SUN	JUL	E	502	12.5	59.27	7.41	13	SUN	AUG
03	020	COL		3.451	124	B	09	W	344	10.86	59.01	6.41	12	THU	NOV	W	440	13.6	60.27	8.2	16	FRI	SEP

									AM PEAK							PM PEAK						
DI	RTE	CO	PRE	PM	CS	LEG	YR	Dir	1 WAY	%	%	%	HR	DAY	MNTH	Dir	1 WAY	%	%	%	HR	DAY	MNTH
03	049	SIE	R	12.23	216	B	09	S	84	23.32	65.63	15.3	12	SUN	AUG	S	86	23.32	67.19	15.66	14	SUN	AUG
02	049	PLU		7.5	121	B	07	S	68	9.69	62.39	6.04	8	WED	FEB	S	98	8.89	98	8.71	21	WED	FEB
03	050	YOL		2.477	410	B	09	E	4959	8.23	54.18	4.46	7	THU	FEB	E	5227	8.68	54.14	4.7	16	WED	APR
03	050	SAC	L	2.43	422	B	09	E	10287	7.77	53.83	4.18	7	WED	MAY	W	9757	7.81	50.81	3.97	16	THU	MAY
03	050	SAC	R	2.131	225	B	09	W	9300	9.06	50.25	4.55	7	TUE	DEC	E	8973	8.36	52.59	4.39	15	FRI	FEB
03	050	SAC	R	3.674	228	A	09	W	9129	9.41	54.33	5.11	7	WED	NOV	E	8157	8.65	52.8	4.57	16	WED	MAR
03	050	SAC	R	5.336	230	A	09	W	8491	9.48	50.94	4.83	7	THU	MAY	E	7978	8.72	52	4.54	15	THU	APR
03	050	SAC	R	7.746	232	A	09	W	8201	9.13	53.06	4.84	7	WED	DEC	E	7857	8.76	52.97	4.64	16	MON	MAR
03	050	SAC	R	10.92	234	A	09	W	8344	9.24	62.97	5.82	7	THU	OCT	E	7494	8.46	61.77	5.22	16	MON	JAN
03	050	SAC		17.01	313	A	09	W	4890	8.2	64.53	5.29	7	WED	FEB	E	4958	8.72	61.57	5.37	16	TUE	NOV
03	050	ED	R	8.564	245	B	07	W	3011	7.8	62.57	4.88	7	MON	APR	E	3370	8.96	61.01	5.46	16	FRI	NOV
03	050	ED	R	25.95	247	B	09	W	1670	14.01	69.12	9.68	11	SUN	AUG	W	1628	14.12	66.86	9.44	13	SUN	AUG
03	050	ED	R	31.30	315	A	09	W	1246	17.52	70.92	12.43	12	SUN	AUG	W	1338	19.26	69.29	13.34	15	SUN	JUL
03	050	ED		72.71	316	A	09	E	1008	13.56	60.54	8.21	12	SAT	JUL	E	910	12.52	59.21	7.41	13	SAT	JUL
03	050	ED		78.42	384	B	09	W	1642	9.83	56.02	5.51	12	SUN	JUN	E	1682	10.29	54.81	5.64	15	SAT	AUG
03	051	SAC		1.204	426	B	09	N	5694	7.08	52.73	3.73	8	THU	APR	S	5920	7.36	52.7	3.88	15	WED	MAY
03	051	SAC		1.204	427	A	09	N	5554	7.09	52.99	3.76	11	FRI	MAR	S	5519	6.99	53.41	3.73	16	SAT	MAR
03	051	SAC		3.357	430	B	09	N	5990	7.22	51.82	3.74	12	FRI	FEB	S	5916	7.19	51.43	3.7	14	MON	NOV
03	051	SAC		4.061	432	A	09	S	8025	7.97	63.99	5.1	7	WED	APR	N	7433	7.87	60.02	4.73	16	MON	DEC
03	051	SAC		7.969	433	A	09	S	5421	7.25	59.59	4.32	7	THU	MAR	N	6496	7.99	64.82	5.18	17	WED	APR
11	052	SD		3.761	703	B	09	W	3891	8.63	53.29	4.6	7	THU	MAY	E	4650	9.28	59.27	5.5	15	THU	JUL
11	052	SD		5.494	725	B	09	W	5564	9.96	59.62	5.94	7	THU	MAR	E	4868	9.03	57.54	5.2	16	WED	APR
11	052	SD		5.494	726	A	09	W	6301	9.66	65.49	6.33	7	FRI	OCT	E	5294	8.99	59.1	5.32	16	WED	APR
11	052	SD		13.27	729	B	09	W	5382	9.59	75.87	7.27	7	MON	OCT	E	4581	8.67	71.41	6.19	17	TUE	OCT
11	052	SD		13.27	730	A	09	W	4093	9.38	72.09	6.76	7	WED	JUN	E	3440	8.67	65.55	5.69	17	TUE	OCT
01	053	LAK		5.15	728	A	08	N	365	9.13	52.14	4.76	12	MON	MAY	S	424	10.3	53.67	5.53	16	FRI	JUL
01	053	LAK		7.413	729	B	08	N	327	8.97	71.4	6.4	12	FRI	MAY	N	355	9.64	72.15	6.95	15	FRI	MAR
11	054	SD		1.88	814	A	09	W	6830	8.08	67.13	5.42	7	THU	FEB	E	6127	8.22	59.19	4.86	16	TUE	FEB
11	054	SD		4.207	816	A	09	W	5284	8.33	62.56	5.21	7	WED	MAY	E	4682	8.23	56.09	4.62	17	TUE	SEP
11	054	SD	T	11.85	817	A	09	W	1005	7.64	56.46	4.31	12	SAT	FEB	W	1148	8.98	54.88	4.93	15	MON	MAY
12	055	ORA	R	2.772	909	B	07	N	3867	6.9	59.64	4.12	7	THU	OCT	N	3399	6.82	53.08	3.62	15	THU	JUL
12	055	ORA	R	3.776	910	B	09	N	6669	7.65	71.8	5.49	8	TUE	DEC	N	5566	7.67	59.8	4.59	16	WED	JUL
12	055	ORA		14.37	94	A	08	S	8996	6.99	56.55	3.95	7	TUE	APR	N	10129	7.77	57.24	4.45	17	MON	JUN

									AM PEAK							PM PEAK						
DI	RTE	CO	PRE	PM	CS	LEG	YR	Dir	1 WAY	%	%	%	HR	DAY	MNTH	Dir	1 WAY	%	%	%	HR	DAY	MNTH
11	163	SD		.89	885	B	09	S	2921	8.52	66.43	5.66	8	WED	APR	N	2944	9.33	61.17	5.71	17	TUE	APR
11	163	SD		2.49	933	A	09	S	4365	7.8	58.89	4.59	7	WED	APR	N	4065	7.85	54.45	4.28	16	WED	APR
11	163	SD		4.371	957	A	09	N	7567	8.58	52.08	4.47	7	THU	MAR	S	7924	9.23	50.69	4.68	17	WED	AUG
11	163	SD	R	10.84	685	B	09	S	8492	9.36	66.59	6.24	7	WED	FEB	S	6819	9.88	50.68	5.01	17	TUE	AUG
11	163	SD	R	11.66	921	B	09	S	7856	9.2	68.22	6.27	7	WED	FEB	N	6617	9.42	56.1	5.28	16	WED	AUG
10	165	MER		26.87	67	A	09	N	267	7.75	57.79	4.48	7	TUE	OCT	N	301	8.3	60.81	5.05	14	THU	AUG
05	166	SB		0	130	A	09	W	674	8.62	89.63	7.72	5	WED	JUL	E	708	14.87	54.55	8.11	17	TUE	NOV
05	166	SB		7.87	132	B	08	E	747	9.62	51.88	4.99	12	FRI	APR	W	905	11.62	52.01	6.05	17	FRI	JUL
05	166	SLO		8.927	227	A	07	W	215	11.2	64.37	7.21	11	SAT	MAY	E	241	12.44	64.96	8.08	14	SUN	AUG
06	166	KER		.01	109	A	09	W	114	8.67	52.54	4.56	11	WED	JUL	E	147	10.15	57.87	5.88	14	FRI	APR
06	166	KER		22.77	613	B	09	W	258	13.81	91.82	12.68	7	THU	JAN	E	196	11.5	83.76	9.63	17	THU	JAN
06	168	FRE	R	.993	647	B	09	W	4528	10.71	57.1	6.12	7	WED	FEB	E	4433	9.86	60.73	5.99	16	TUE	JAN
06	168	FRE	R	2.017	646	B	07	E	3316	8.8	59.9	5.27	7	WED	MAR	E	4677	10.27	72.36	7.43	17	WED	MAR
06	168	FRE	R	3.035	645	B	07	W	5893	10.73	64.24	6.9	7	THU	MAR	E	5388	10.2	61.81	6.3	17	THU	SEP
06	168	FRE	R	4.258	600	B	09	W	5210	11.74	63.96	7.51	7	TUE	OCT	E	4741	10.83	63.1	6.83	17	THU	MAR
06	168	FRE	R	4.258	611	A	07	W	5065	12.16	73.22	8.9	7	THU	SEP	E	4038	10.62	66.83	7.1	17	WED	SEP
06	168	FRE	R	6.866	671	B	07	W	4088	12.09	76.14	9.2	7	TUE	MAR	E	3122	10.49	66.98	7.03	17	TUE	SEP
06	168	FRE	R	8.042	680	B	09	W	2961	12.23	80.22	9.81	7	WED	FEB	E	2190	10.41	69.72	7.26	17	MON	NOV
06	168	FRE	R	9.15	651	A	07	W	919	11.85	74.35	8.81	7	THU	DEC	E	695	9.65	69.02	6.66	17	MON	DEC
06	168	FRE		15.47	51	A	07	W	548	10.24	78.06	7.99	7	THU	MAR	E	464	9.62	70.3	6.77	17	THU	JUN
06	168	FRE	T	23.72	168	A	07	W	264	9.7	71.74	6.96	7	THU	DEC	E	334	12.44	70.76	8.8	16	FRI	SEP
06	168	FRE	R	36.18	162	A	07	W	615	10.67	60.95	6.5	12	SUN	JUN	E	601	8.65	73.47	6.35	18	THU	JUN
06	168	FRE		49.66	113	B	07	E	247	24.74	95.37	23.59	10	SAT	MAR	W	274	27.89	93.84	26.17	15	SUN	MAR
09	168	INY	R	3.278	975	A	09	E	83	24.71	56.46	13.95	12	SUN	AUG	E	81	16.64	81.82	13.61	14	SUN	JUL
09	168	INY		14.74	915	B	09	W	93	12.38	62	7.67	11	FRI	MAY	E	96	12.62	62.75	7.92	14	SUN	APR
09	168	INY		16.34	976	A	09	E	361	7.46	75.84	5.66	7	TUE	APR	W	353	10.29	53.73	5.53	16	WED	APR
09	168	INY		18.31	941	B	09	E	487	10.85	54.72	5.94	12	FRI	JUN	E	474	10.23	56.5	5.78	14	MON	DEC
09	168	INY		18.32	942	A	09	E	43	12.92	74.14	9.58	8	FRI	OCT	W	43	13.81	69.36	9.58	14	THU	JUN
01	169	DN		1.86	169	B	08	W	62	10.66	62.63	6.67	12	MON	AUG	E	68	12.16	60.18	7.32	16	SAT	AUG
07	170	LA	R	17.62	541	O	09	S	8459	8.04	61.28	4.93	7	THU	MAY	N	6921	7.13	56.54	4.03	17	FRI	JUN
02	172	TEH		8.917	154	B	07	E	15	23.48	55.56	13.04	12	SAT	AUG	E	18	26.09	60	15.65	15	SAT	AUG
03	174	PLA		.73	867	A	09	S	798	18.9	56.4	10.66	8	TUE	DEC	N	496	10.42	63.59	6.62	16	WED	DEC
03	174	PLA		2.883	870	O	09	S	250	9.07	55.8	5.06	7	THU	SEP	N	288	10.49	55.6	5.83	17	MON	DEC

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL ---- By Axle ---- 2	3	4	5+	% TRUCK AADT ---- By Axle ---- 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
015	11	SD	2.226	B	JCT. RTE. 94	116,000	5,916	5.10	3,029	1,006	296	1,585	51.20	17.00	5.00	26.80	789	85V
015	11	SD	R 3.367	B	JCT. RTE. 805	109,000	5,559	5.10	2,846	945	278	1,490	51.20	17.00	5.00	26.80	741	85E
015	11	SD	R 3.367	A	JCT. RTE. 805	159,000	3,498	2.20	2,526	357	108	507	72.20	10.20	3.10	14.50	312	85V
015	11	SD	R 6.132	B	JCT. RTE. 8	162,000	3,564	2.20	2,573	367	110	513	72.20	10.30	3.10	14.40	317	85E
015	11	SD	R 6.132	A	JCT. RTE. 8	200,000	9,960	4.98	6,219	712	234	2,794	62.44	7.15	2.35	28.05	1,281	07V
015	11	SD	M 12.124	A	JCT. RTE. 163	296,000	11,041	3.73	6,784	795	305	3,158	61.44	7.20	2.76	28.60	1,445	07E
015	11	SD	M 14.285	B	SAN DIEGO, MIRAMAR/ POMERADO ROADS	293,000	11,017	3.76	6,769	793	304	3,151	61.44	7.20	2.76	28.60	1,442	07E
015	11	SD	M 14.285	A	SAN DIEGO, MIRAMAR/ POMERADO ROADS	275,000	10,725	3.90	6,285	1,126	418	2,896	58.60	10.50	3.90	27.00	1,384	85V
015	11	SD	M 18.176	B	SAN DIEGO, POWAY ROAD	236,000	16,756	7.10	8,177	1,893	938	5,747	48.80	11.30	5.60	34.30	2,581	96E
015	11	SD	M 18.176	A	SAN DIEGO, POWAY ROAD	208,000	14,768	7.10	7,207	1,669	827	5,065	48.80	11.30	5.60	34.30	2,275	96E
015	11	SD	M 27.65	A	ESCONDIDO, SOUTH JUNCTION OF CENTRE CITY PARKWAY	176,000	12,496	7.10	6,098	1,412	700	4,286	48.80	11.30	5.60	34.30	1,925	96E
015	11	SD	R 30.627	B	VALLEY PARKWAY	181,000	12,851	7.10	6,271	1,452	720	4,408	48.80	11.30	5.60	34.30	1,980	96E
015	11	SD	R 31.517	B	JCT. RTE. 78	194,000	13,774	7.10	6,722	1,556	771	4,724	48.80	11.30	5.60	34.30	2,122	96E
015	11	SD	R 31.517	A	JCT. RTE. 78	128,000	12,928	10.10	5,714	1,112	672	5,430	44.20	8.60	5.20	42.00	2,274	80V
015	11	SD	R 36.636	A	DEER SPRINGS ROAD	120,000	15,840	13.20	5,592	1,283	665	8,300	35.30	8.10	4.20	52.40	3,275	86V
015	11	SD	R 46.491	B	JCT. RTE. 76	110,000	11,253	10.23	3,581	895	384	6,394	31.82	7.95	3.41	56.82	2,470	00E
015	11	SD	R 46.491	A	JCT. RTE. 76	116,000	9,442	8.14	3,068	720	320	5,335	32.49	7.63	3.39	56.50	2,061	00E

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL ---- By Axle ---- 2	3	4	5+	% TRUCK AADT ---- By Axle ---- 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
052	11	SD	0.324	A	JCT. RTE. 5	80,000	2,640	3.30	1,798	383	63	396	68.10	14.50	2.40	15.00	244	87E
052	11	SD	2.292	B	SAN DIEGO, GENESEE AVENUE	79,000	2,607	3.30	1,775	378	63	391	68.10	14.50	2.40	15.00	241	87E
052	11	SD	3.761	B	JCT. RTE. 805	86,000	2,666	3.10	1,853	475	83	256	69.50	17.80	3.10	9.60	209	96E
052	11	SD	8.713	A	SANTO ROAD	78,000	2,028	2.60	1,590	256	37	146	78.40	12.60	1.80	7.20	135	96E

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL ---- By Axle ---- 2	3	4	5+	% TRUCK AADT ---- By Axle ---- 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
163	11	SD	0.89	A	JCT. RTE. 5	110,000	3,300	3.00	2,389	409	69	432	72.40	12.40	2.10	13.10	280	86V
163	11	SD	3.742	B	SAN DIEGO, JCT. RTE. 8	161,000	4,830	3.00	3,497	599	101	633	72.40	12.40	2.10	13.10	411	86E
163	11	SD	3.742	A	SAN DIEGO, JCT. RTE. 8	151,000	5,587	3.70	3,598	860	140	989	64.40	15.40	2.50	17.70	567	86V
163	11	SD	7.043	B	SAN DIEGO, JCT. RTE. 805	163,000	6,031	3.70	3,884	929	151	1,067	64.40	15.40	2.50	17.70	612	86E
163	11	SD	7.043	A	SAN DIEGO, JCT. RTE. 805	140,000	7,140	5.10	3,941	1,100	243	1,856	55.20	15.40	3.40	26.00	915	86E
163	11	SD	8.01	A	SAN DIEGO, BALBOA AVENUE	139,000	3,934	2.83	2,041	650	380	863	51.89	16.51	9.67	21.93	485	04E
163	11	SD	R 10.837	B	SAN DIEGO, KEARNEY VILLA ROAD INTERCHANGE	135,619	4,380	3.23	3,158	392	196	633	72.11	8.95	4.48	14.46	394	10V
163	11	SD	R 11.662	B	JCT. RTE. 15	118,000	3,729	3.16	1,935	616	361	818	51.88	16.51	9.67	21.93	460	04E

B – 5

RAMP METER DATA OBTAINED FROM CALTRANS, RAMP METER HOV PERCENTAGES FROM PEMS, AND FIELD OBSERVATIONS OF QUEUES AND DELAYS AT ON-RAMPS

Location (I.D.)	Route	Dir	Period	Cars per green	Fast. rate (cyc./min.)	Slow. rate (cyc./min.)	Rate Delta	Sec./ Cycle	(per lane) Veh./hr	Total # lanes	HOV
WB Clairemont Mesa Blvd (161)	163	NB	1500 - 1900	2	8.3	4.9	0.24	7.2 - 12.1	996 - 593	2	Lt
WB Clairemont Mesa Blvd (112)	163	SB	1500 - 1900	2	7.5	4.3	0.23	8.0 - 14.0	900 - 514	2	No
Clairemont Mesa Blvd (144)	15	NB	1500 - 1900	1	8.3	4.0	0.31	7.2 - 15.2	498 - 238	2	No
Clairemont Mesa Blvd (11507)	15	SB	1500 - 1900	2	4	2.6	0.10	15 - 23.1	480 - 312	3	Lt
EB Balboa Ave (143)	15	NB	1500 - 1900	2	8.3	5.5	0.20	7.2 - 10.9	996 - 660	1	No
EB Balboa Ave (139)	15	SB	1500 - 1900	2	5.9	3.1	0.20	10.2 - 19.4	708 - 372	3	Lt

There are 15 separate rates or steps that depend on the mainlane volumes. The Cycles/min. have a definite rate delta whereas the seconds/cycle from one rate to another can vary from 0.1 - 0.4 sec.

HOV Percentages of Ramp Volumes

	Average PM Peak Hour (17:00) Ramp Volumes	HOV lane volumes	HOV %	Period
I-15				
NB-on from Clairemont Mesa	**No HOV lane**			
SB-on from Clairemont Mesa	737	83	11%	Aug 2012 - Dec 2012
SB-on from EB Balboa	882	127	14%	Aug 2012 - Dec 2012
SR 163				
NB-on from WB Clairemont Mesa	446	55	12%	Aug 2012 - Dec 2012
SB-on from WB Clairemont Mesa	**No HOV lane**			

Clairemont Mesa Blvd and I-15 Interchange Queuing, May 31, 2012

Clairemont Mesa Blvd and I-15 SB Queuing, 5:00 p.m. - 5:15 p.m.	
Maximum number of cars waiting on the Ramp	24
Time it took for cars on the On-Ramp to get on the freeway (seconds) [a]	
5:09 p.m.	150
5:12 p.m.	132
5:15 p.m.	165
Average Delay	**2**
Clairemont Mesa Blvd and I-15 NB Queuing, 5:15 p.m. - 5:30 p.m.	
Maximum number of cars waiting on the Ramp	7
Time it took for cars on the On-Ramp to get on the freeway (seconds) [a]	
5:23 p.m.	52
5:25 p.m.	25
5:26 p.m.	33
Average Delay	**1**

Footnote:

a. Timing started when cars passed the crosswalk.

b. Measured in number of cars.

c. Cars in this movement had an ongoing green light or right turn on red. Queuing went past the Murphy Canyon Road/Clairemont Mesa Boulevard intersection.

Balboa Avenue and I-15 Interchange Queuing, June 6, 2012

Balboa Ave and I-15 SB Queuing, 5:00 p.m. - 5:36 p.m.	
Time it took for cars on the On-Ramp to get on the freeway (seconds) [a]	
Number of cars waiting on the EBR lane [b, c]	46
5:10 p.m.	318
5:22 p.m.	420
5:36 p.m.	280
Average Delay	**6**

Footnote:

a. Timing started when driver's car comes to a stop

B – 6

DAILY COUNT SHEETS AT THE PROJECT DRIVEWAYS

Volumes for: Thursday, January 12, 2012 **City:** San Diego **Project #** 12-1004-016

Location : Project Driveway #1 at Clairemont Mesa Blvd.

DAY 3

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	8		8				
00:15	0		0					12:15	9		26				
00:30	0		0					12:30	5		23				
00:45	0	0	0	0				12:45	6	28	34	91			119
01:00	0		0					13:00	7		23				
01:15	0		0					13:15	12		24				
01:30	0		0					13:30	10		12				
01:45	0	0	0	0				13:45	11	40	16	75			115
02:00	0		0					14:00	20		14				
02:15	0		0					14:15	13		14				
02:30	0		0					14:30	10		25				
02:45	0	0	0	0				14:45	15	58	19	72			130
03:00	0		0					15:00	15		9				
03:15	0		0					15:15	9		6				
03:30	0		0					15:30	27		7				
03:45	0	0	0	0				15:45	29	80	8	30			110
04:00	0		0					16:00	41		6				
04:15	0		0					16:15	40		9				
04:30	0		0					16:30	24		7				
04:45	0	0	0	0				16:45	20	125	1	23			148
05:00	0		0					17:00	21		3				
05:15	1		3					17:15	6		2				
05:30	0		2					17:30	8		5				
05:45	1	2	3	8			10	17:45	0	35	1	11			46
06:00	0		12					18:00	6		1				
06:15	0		10					18:15	0		0				
06:30	1		16					18:30	2		0				
06:45	5	6	37	75			81	18:45	0	8	0	1			9
07:00	5		36					19:00	6		1				
07:15	3		47					19:15	0		0				
07:30	5		40					19:30	0		0				
07:45	7	20	47	170			190	19:45	0	6	0	1			7
08:00	17		47					20:00	0		0				
08:15	5		40					20:15	0		0				
08:30	4		17					20:30	0		0				
08:45	9	35	21	125			160	20:45	0	0	0	0			
09:00	8		21					21:00	0		0				
09:15	5		6					21:15	0		0				
09:30	5		3					21:30	0		0				
09:45	6	24	27	57			81	21:45	0	0	0	0			
10:00	5		10					22:00	0		0				
10:15	3		18					22:15	0		0				
10:30	10		9					22:30	0		0				
10:45	12	30	10	47			77	22:45	0	0	0	0			
11:00	5		0					23:00	0		0				
11:15	16		18					23:15	0		0				
11:30	11		9					23:30	0		0				
11:45	8	40	13	40			80	23:45	0	0	0	0			
Total Vol.		157		522			**679**			380		304			**684**

Daily Totals

NB	SB	EB	WB	**Combined**
537	826			**1363**

	AM			**PM**		
Split %	23.1%	76.9%	**49.8%**	55.6%	44.4%	**50.2%**
Peak Hour	10:45	07:15	**07:15**	15:30	12:15	**15:30**
Volume	44	181	**213**	137	106	**167**
P.H.F.	0.69	0.96	**0.83**	0.84	0.78	**0.85**

Volumes for: Thursday, January 12, 2012 **City:** San Diego **Project #** 12-1004-017

Location : Project Driveway #2 at Ruffin Rd.

DAY 3

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			9		13		
00:15			0		0			12:15			18		15		
00:30			0		0			12:30			20		21		
00:45			0	0	0	0		12:45			24	71	24	73	144
01:00			0		0			13:00			20		17		
01:15			0		0			13:15			8		17		
01:30			0		0			13:30			14		13		
01:45			0	0	0	0		13:45			6	48	21	68	116
02:00			0		0			14:00			17		13		
02:15			0		0			14:15			9		15		
02:30			0		0			14:30			6		11		
02:45			0	0	0	0		14:45			14	46	9	48	94
03:00			0		0			15:00			21		13		
03:15			0		0			15:15			5		18		
03:30			0		0			15:30			8		19		
03:45			0	0	0	0		15:45			6	40	12	62	102
04:00			0		0			16:00			5		33		
04:15			0		0			16:15			10		21		
04:30			0		0			16:30			6		25		
04:45			0	0	0	0		16:45			3	24	11	90	114
05:00			0		0			17:00			6		16		
05:15			5		2			17:15			1		10		
05:30			0		0			17:30			0		8		
05:45			1	6	0	2	8	17:45			0	7	4	38	45
06:00			0		1			18:00			0		2		
06:15			0		1			18:15			0		1		
06:30			8		7			18:30			0		0		
06:45			8	16	2	11	27	18:45			0	0	4	7	7
07:00			11		2			19:00			0		3		
07:15			26		6			19:15			1		2		
07:30			19		7			19:30			0		0		
07:45			39	95	6	21	116	19:45			0	1	0	5	6
08:00			35		12			20:00			0		0		
08:15			32		9			20:15			0		0		
08:30			28		4			20:30			0		0		
08:45			16	111	6	31	142	20:45			0	0	0	0	
09:00			10		6			21:00			0		0		
09:15			16		5			21:15			0		0		
09:30			10		7			21:30			0		0		
09:45			11	47	11	29	76	21:45			0	0	0	0	
10:00			14		7			22:00			0		0		
10:15			15		10			22:15			0		0		
10:30			12		12			22:30			0		0		
10:45			15	56	13	42	98	22:45			0	0	0	0	
11:00			13		12			23:00			0		0		
11:15			16		14			23:15			0		0		
11:30			26		13			23:30			0		0		
11:45			12	67	20	59	126	23:45			0	0	0	0	
Total Vol.				398		195	**593**					237		391	**628**

Daily Totals

NB	SB	EB	WB	**Combined**
		635	586	**1221**

	AM			**PM**		
Split %	67.1%	32.9%	**48.6%**	37.7%	62.3%	**51.4%**
Peak Hour	07:45	11:45	**07:45**	12:15	15:45	**12:15**
Volume	134	69	**165**	82	91	**159**
P.H.F.	0.86	0.82	**0.88**	0.85	0.69	**0.83**

Volumes for: Thursday, January 12, 2012 **City:** San Diego **Project #** 12-1004-018

Location : Project Driveway #3 at Ruffin Ct.

DAY 3

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	7		11				
00:15	0		2					12:15	9		9				
00:30	0		0					12:30	9		6				
00:45	0	0	0	2			2	12:45	11	36	9	35			71
01:00	0		0					13:00	5		7				
01:15	0		0					13:15	7		9				
01:30	0		0					13:30	13		8				
01:45	0	0	0	0				13:45	8	33	5	29			62
02:00	2		0					14:00	11		6				
02:15	0		1					14:15	7		9				
02:30	0		0					14:30	9		8				
02:45	0	2	0	1			3	14:45	7	34	9	32			66
03:00	0		0					15:00	5		9				
03:15	0		0					15:15	9		5				
03:30	0		0					15:30	6		8				
03:45	0	0	0	0				15:45	12	32	7	29			61
04:00	0		0					16:00	5		15				
04:15	4		0					16:15	6		11				
04:30	2		1					16:30	8		15				
04:45	0	6	0	1			7	16:45	1	20	11	52			72
05:00	2		0					17:00	0		19				
05:15	4		1					17:15	6		10				
05:30	5		2					17:30	1		6				
05:45	16	27	2	5			32	17:45	3	10	2	37			47
06:00	12		3					18:00	3		5				
06:15	14		3					18:15	2		1				
06:30	6		2					18:30	0		3				
06:45	18	50	10	18			68	18:45	4	9	3	12			21
07:00	25		5					19:00	4		1				
07:15	19		6					19:15	0		4				
07:30	11		6					19:30	5		2				
07:45	10	65	2	19			84	19:45	0	9	2	9			18
08:00	14		2					20:00	0		4				
08:15	9		2					20:15	0		1				
08:30	6		1					20:30	2		0				
08:45	3	32	2	7			39	20:45	0	2	1	6			8
09:00	7		3					21:00	0		1				
09:15	11		2					21:15	0		0				
09:30	8		5					21:30	0		0				
09:45	2	28	4	14			42	21:45	0	0	0	1			1
10:00	10		7					22:00	1		3				
10:15	6		8					22:15	4		5				
10:30	7		9					22:30	0		1				
10:45	5	28	9	33			61	22:45	0	5	1	10			15
11:00	5		9					23:00	0		2				
11:15	4		10					23:15	0		0				
11:30	7		10					23:30	0		1				
11:45	4	20	8	37			57	23:45	0	0	1	4			4
Total Vol.		258		137			**395**			190		256			**446**

Daily Totals

NB	SB	EB	WB	**Combined**
448	393			**841**

	AM			**PM**		
Split %	65.3%	34.7%	**47.0%**	42.6%	57.4%	**53.0%**
Peak Hour	06:45	11:15	**06:45**	13:15	16:15	**15:45**
Volume	73	39	**100**	39	56	**79**
P.H.F.	0.73	0.89	**0.83**	0.75	0.74	**0.86**

Volumes for: Wednesday, January 18, 2012 **City:** San Diego **Project #** 12-1011-019

Location : Project Driveway #4 at Ruffin Rd.

DAY 1

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			0		1		
00:15			0		0			12:15			0		1		
00:30			0		0			12:30			1		0		
00:45			0	0	0	0		12:45			0	1	0	2	3
01:00			0		0			13:00			1		2		
01:15			0		0			13:15			0		0		
01:30			0		0			13:30			2		0		
01:45			0	0	0	0		13:45			2	5	1	3	8
02:00			0		0			14:00			3		0		
02:15			0		0			14:15			1		2		
02:30			0		0			14:30			0		2		
02:45			0	0	0	0		14:45			0	4	0	4	8
03:00			0		0			15:00			4		0		
03:15			0		0			15:15			3		3		
03:30			0		0			15:30			3		1		
03:45			0	0	0	0		15:45			2	12	1	5	17
04:00			0		1			16:00			0		3		
04:15			0		0			16:15			0		3		
04:30			0		0			16:30			0		1		
04:45			0	0	0	1	1	16:45			0	0	2	9	9
05:00			0		0			17:00			0		5		
05:15			0		0			17:15			0		2		
05:30			0		0			17:30			1		1		
05:45			0	0	0	0		17:45			0	1	1	9	10
06:00			0		0			18:00			0		1		
06:15			0		1			18:15			0		1		
06:30			1		0			18:30			0		0		
06:45			1	2	0	1	3	18:45			0	0	0	2	2
07:00			1		1			19:00			0		0		
07:15			2		0			19:15			0		0		
07:30			1		2			19:30			0		0		
07:45			1	5	1	4	9	19:45			1	1	0	0	1
08:00			5		7			20:00			0		0		
08:15			0		0			20:15			0		0		
08:30			0		3			20:30			0		0		
08:45			0	5	1	11	16	20:45			0	0	0	0	
09:00			0		1			21:00			0		0		
09:15			2		1			21:15			0		0		
09:30			0		0			21:30			0		0		
09:45			1	3	0	2	5	21:45			0	0	0	0	
10:00			1		0			22:00			0		0		
10:15			1		1			22:15			0		0		
10:30			0		0			22:30			0		0		
10:45			1	3	0	1	4	22:45			0	0	0	0	
11:00			2		0			23:00			0		0		
11:15			0		1			23:15			0		0		
11:30			1		0			23:30			0		0		
11:45			2	5	0	1	6	23:45			0	0	0	0	
Total Vol.				23		21	**44**					24		34	**58**

Daily Totals

NB	SB	EB	WB	**Combined**
		47	55	**102**

	AM			**PM**		
Split %	52.3%	47.7%	**43.1%**	41.4%	58.6%	**56.9%**
Peak Hour	07:15	07:45	**07:15**	15:00	16:15	**15:00**
Volume	9	11	**19**	12	11	**17**
P.H.F.	0.45	0.39	**0.40**	0.75	0.55	**0.71**

Narasimha Prasad

From: Redlitz, Jeff <Jeff.Redlitz@sdcounty.ca.gov>
Sent: Thursday, December 20, 2012 2:48 PM
To: Narasimha Prasad
Subject: RE: Employee population at the County Operations Center Annex

All notes are confirmed.

Jeff Redlitz, Project Manager
Department of General Services
858-694-8834
jeff.redlitz@sdcounty.ca.gov

From: Narasimha Prasad [mailto:prasad@llgengineers.com]
Sent: Tuesday, December 18, 2012 8:46 AM
To: Redlitz, Jeff
Subject: Employee population at the County Operations Center Annex

Hello Jeff:

Can you please confirm the following information regarding the Employee population at the County Operations Center Annex at 5201 Ruffin Road, San Diego in January 2012? This is based on our conversation in this matter in March 2012.

1. Currently there are 300 employees at the site.
2. DPW Development review groups - DPLU consisting of 50 to 60 employees moved out of the building
3. The Health Agency consisting of 120 employees moved out 3 years ago to a new building a block away.
4. A training facility with around 50 trainees from outside moved out a year ago.
5. The Health Agency with about 120 employees vacated this building about three years ago.

Thank you for your help in this matter.

Prasad

Narasimha Prasad
Senior Transportation Engineer
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APPENDIX C

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS - EXISTING

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	604	23	268	1551	196	22	10	127	104	13	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.87	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5000		1770	1543	1504	3433	3166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5000		1770	1543	1504	3433	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	657	25	291	1686	213	24	11	138	113	14	33
RTOR Reduction (vph)	0	0	9	0	8	0	0	62	58	0	30	0
Lane Group Flow (vph)	35	657	16	291	1891	0	24	14	15	113	17	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	4.7	58.4	70.5	17.4	70.5		5.0	5.4	22.8	9.6	10.3	
Effective Green, g (s)	4.7	58.4	70.5	17.4	70.5		5.0	5.4	22.8	9.6	10.3	
Actuated g/C Ratio	0.04	0.53	0.64	0.16	0.64		0.05	0.05	0.21	0.09	0.09	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	76	2700	1015	543	3205		80	76	372	300	296	
v/s Ratio Prot	0.02	0.13		c0.08	c0.38		0.01	c0.01	0.01	c0.03	0.01	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.46	0.24	0.02	0.54	0.59		0.30	0.19	0.04	0.38	0.06	
Uniform Delay, d1	51.4	13.9	7.2	42.6	11.4		50.8	50.2	34.9	47.4	45.4	
Progression Factor	1.00	1.00	1.00	0.98	0.73		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.0	0.5	0.3		0.8	0.4	0.0	0.3	0.0	
Delay (s)	53.0	14.1	7.2	42.4	8.6		51.6	50.6	34.9	47.7	45.5	
Level of Service	D	B	A	D	A		D	D	C	D	D	
Approach Delay (s)		15.8			13.1			44.1			47.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	17.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.4	
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	605	230	0	1032	387	0	0	914	0	0	168
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	658	250	0	1122	421	0	0	993	0	0	183
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.97			0.93			0.95	0.95	0.93	0.95	0.95	0.97
vC, conflicting volume	1542			908			1401	2200	329	2444	2029	561
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1490			756			1152	1993	135	2250	1813	473
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	65
cM capacity (veh/h)	431			793			94	57	829	0	74	519

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	329	329	250	561	561	421	993	91	91
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	250	0	0	421	993	91	91
cSH	1700	1700	1700	1700	1700	1700	829	519	519
Volume to Capacity	0.19	0.19	0.15	0.33	0.33	0.25	1.20	0.18	0.18
Queue Length 95th (ft)	0	0	0	0	0	0	804	16	16
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	119.9	13.4	13.4
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			119.9	13.4	
Approach LOS							F	B	

Intersection Summary			
Average Delay	33.5		
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1314	205	0	597	168	822	0	682	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1428	223	0	649	183	893	0	741	0	0	0
RTOR Reduction (vph)	0	0	114	0	0	94	0	0	8	0	0	0
Lane Group Flow (vph)	0	1428	109	0	649	89	446	447	733	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		53.7	53.7		53.7	53.7	45.5	45.5	45.5			
Effective Green, g (s)		53.7	53.7		53.7	53.7	45.5	45.5	45.5			
Actuated g/C Ratio		0.49	0.49		0.49	0.49	0.41	0.41	0.41			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2482	773		2482	773	695	695	1153			
v/s Ratio Prot		c0.28			0.13		0.27	c0.27	0.26			
v/s Ratio Perm			0.07			0.06						
v/c Ratio		0.58	0.14		0.26	0.12	0.64	0.64	0.64			
Uniform Delay, d1		20.0	15.5		16.5	15.3	25.7	25.8	25.7			
Progression Factor		0.83	0.33		0.71	0.84	1.00	1.00	1.00			
Incremental Delay, d2		1.0	0.4		0.3	0.3	2.0	2.0	1.2			
Delay (s)		17.6	5.4		11.9	13.2	27.8	27.8	26.8			
Level of Service		B	A		B	B	C	C	C			
Approach Delay (s)		15.9			12.2			27.4			0.0	
Approach LOS		B			B			C			A	

Intersection Summary				
HCM Average Control Delay	19.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	1082	758	51	552	9	86	51	86	22	43	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	1176	824	55	600	10	93	55	93	24	47	138
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	33	0	0	49
Lane Group Flow (vph)	170	1176	824	55	600	1	93	55	60	24	47	89
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	4.9	70.9	110.0	4.9	70.8	10.2	8.1	10.2	70.9	4.8	7.1	70.8
Effective Green, g (s)	4.9	70.9	110.0	4.9	70.8	10.2	8.1	10.2	70.9	4.8	7.1	70.8
Actuated g/C Ratio	0.04	0.64	1.00	0.04	0.64	0.09	0.07	0.09	0.64	0.04	0.06	0.64
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	3278	1583	79	3273	147	253	173	1020	77	120	1019
v/s Ratio Prot	c0.05	0.23		0.03	0.12		0.03	0.03		0.01	0.03	
v/s Ratio Perm			c0.52			0.00			0.04			0.06
v/c Ratio	1.11	0.36	0.52	0.70	0.18	0.01	0.37	0.32	0.06	0.31	0.39	0.09
Uniform Delay, d1	52.5	9.0	0.0	51.8	7.9	45.3	48.5	46.6	7.2	51.0	49.4	7.4
Progression Factor	1.00	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.5	0.3	1.0	23.4	0.1	0.0	0.9	1.1	0.1	2.3	2.1	0.2
Delay (s)	152.0	6.4	1.0	75.2	8.0	45.3	49.4	47.7	7.3	53.3	51.5	7.6
Level of Service	F	A	A	E	A	D	D	D	A	D	D	A
Approach Delay (s)		15.8			14.2			32.8			22.7	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM Average Control Delay	17.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.4	
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	699	98	61	525	79	37	2	36	44	1	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	4991		1770	4985			1778	1583		1776	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.70	1.00
Satd. Flow (perm)	1770	4991		1770	4985			1305	1583		1303	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	760	107	66	571	86	40	2	39	48	1	36
RTOR Reduction (vph)	0	11	0	0	12	0	0	0	36	0	0	33
Lane Group Flow (vph)	234	856	0	66	645	0	0	42	3	0	49	3
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	18.1	68.5		7.8	58.2			7.7	7.7		7.7	7.7
Effective Green, g (s)	18.1	68.5		7.8	58.2			7.7	7.7		7.7	7.7
Actuated g/C Ratio	0.19	0.71		0.08	0.61			0.08	0.08		0.08	0.08
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	334	3561		144	3022			105	127		105	127
v/s Ratio Prot	c0.13	c0.17		0.04	0.13							
v/s Ratio Perm								0.03	0.00		c0.04	0.00
v/c Ratio	0.70	0.24		0.46	0.21			0.40	0.02		0.47	0.02
Uniform Delay, d1	36.4	4.8		42.1	8.5			42.0	40.7		42.2	40.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.5	0.2		2.3	0.2			2.5	0.1		3.3	0.1
Delay (s)	42.9	4.9		44.4	8.7			44.4	40.8		45.4	40.8
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		13.0			12.0			42.7			43.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	132	653	69	116	544	39	101	43	38	28	16	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5012		3433	5085	1583	1770	3292		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5012		3433	5085	1583	1770	3292		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	710	75	126	591	42	110	47	41	30	17	49
RTOR Reduction (vph)	0	11	0	0	0	30	0	24	0	0	0	33
Lane Group Flow (vph)	143	774	0	126	591	12	110	64	0	30	17	16
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	9.7	32.8		8.9	31.9	31.9	13.5	45.6		4.0	36.1	36.1
Effective Green, g (s)	9.7	32.8		8.9	31.9	31.9	13.5	45.6		4.0	36.1	36.1
Actuated g/C Ratio	0.09	0.30		0.08	0.29	0.29	0.12	0.41		0.04	0.33	0.33
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	303	1494		278	1475	459	217	1365		64	611	520
v/s Ratio Prot	0.04	c0.15		0.04	c0.12		c0.06	c0.02		c0.02	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.47	0.52		0.45	0.40	0.03	0.51	0.05		0.47	0.03	0.03
Uniform Delay, d1	47.7	32.0		48.2	31.4	27.9	45.1	19.2		52.0	25.1	25.1
Progression Factor	1.00	1.00		0.71	0.50	0.47	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	1.3		1.1	0.8	0.1	1.9	0.0		5.3	0.1	0.1
Delay (s)	48.9	33.3		35.3	16.4	13.1	47.0	19.2		57.3	25.1	25.2
Level of Service	D	C		D	B	B	D	B		E	C	C
Approach Delay (s)		35.7			19.4			34.7			35.2	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	238	291	135	452	553	188	89	187	63	155	414	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4843		3433	4892		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4843		3433	4892		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	316	147	491	601	204	97	203	68	168	450	136
RTOR Reduction (vph)	0	77	0	0	55	0	0	0	48	0	0	95
Lane Group Flow (vph)	259	386	0	491	750	0	97	203	20	168	450	41
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	12.5	34.1		16.7	38.4		6.8	33.0	33.0	6.6	33.0	33.0
Effective Green, g (s)	12.5	34.1		16.7	38.4		6.8	33.0	33.0	6.6	33.0	33.0
Actuated g/C Ratio	0.11	0.31		0.15	0.35		0.06	0.30	0.30	0.06	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	390	1501		521	1708		212	1062	475	206	1062	475
v/s Ratio Prot	c0.08	0.08		c0.14	c0.15		c0.03	0.06		c0.05	c0.13	
v/s Ratio Perm									0.01			0.03
v/c Ratio	0.66	0.26		0.94	0.44		0.46	0.19	0.04	0.82	0.42	0.09
Uniform Delay, d1	46.7	28.5		46.2	27.5		49.8	28.6	27.3	51.1	30.9	27.7
Progression Factor	0.60	0.09		0.92	0.84		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.4		25.2	0.8		1.6	0.4	0.2	21.4	1.2	0.4
Delay (s)	31.8	2.9		67.5	24.0		51.4	29.0	27.5	72.5	32.1	28.0
Level of Service	C	A		E	C		D	C	C	E	C	C
Approach Delay (s)		13.3			40.5			34.6			40.4	
Approach LOS		B			D			C			D	

Intersection Summary				
HCM Average Control Delay	33.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	28.1	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Clairemont Mesa Boulevard & Murphy Canyon Road

Ex AM
9/24/2012

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	481	117	382	1250	51	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	523	127	415	1359	55	76
RTOR Reduction (vph)	0	0	36	0	0	0	28
Lane Group Flow (vph)	0	523	91	415	1359	55	48
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		56.0	56.0	30.9	91.9	7.7	38.6
Effective Green, g (s)		56.0	56.0	30.9	91.9	7.7	38.6
Actuated g/C Ratio		0.51	0.51	0.28	0.84	0.07	0.35
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1802	806	497	4248	124	555
v/s Ratio Prot		0.15		c0.23	c0.27	c0.03	0.02
v/s Ratio Perm			0.06				0.01
v/c Ratio		0.29	0.11	0.84	0.32	0.44	0.09
Uniform Delay, d1		15.6	14.1	37.2	2.0	49.1	23.9
Progression Factor		0.31	0.16	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4	0.3	11.5	0.2	2.5	0.1
Delay (s)		5.2	2.6	48.7	2.2	51.6	24.0
Level of Service		A	A	D	A	D	C
Approach Delay (s)		4.7			13.1	35.6	
Approach LOS		A			B	D	

Intersection Summary				
HCM Average Control Delay	12.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.7	
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: Clairemont Mesa Boulevard & I-15 SB Off-Ramp

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	309	242	462	991	0	0	0	0	99	1	641
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1447	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1447	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	336	263	502	1077	0	0	0	0	108	1	697
RTOR Reduction (vph)	0	0	184	0	0	0	0	0	0	0	46	46
Lane Group Flow (vph)	0	336	79	502	1077	0	0	0	0	97	308	309
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		24.8	29.9	33.3	62.1					29.9	29.9	29.9
Effective Green, g (s)		24.8	29.9	33.3	62.1					29.9	29.9	29.9
Actuated g/C Ratio		0.25	0.30	0.33	0.62					0.30	0.30	0.30
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		878	833	1143	2198					503	433	450
v/s Ratio Prot		0.09		0.15	c0.30					0.06	c0.21	
v/s Ratio Perm			0.03									0.21
v/c Ratio		0.38	0.09	0.44	0.49					0.19	0.71	0.69
Uniform Delay, d1		31.2	25.3	26.1	10.3					26.1	31.2	30.9
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.0	0.3	0.8					0.2	5.5	4.3
Delay (s)		31.5	25.3	26.3	11.1					26.3	36.7	35.3
Level of Service		C	C	C	B					C	D	D
Approach Delay (s)		28.8			15.9			0.0			34.8	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	79.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	263	0	0	560	198	893	0	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3401		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3401		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	286	0	0	609	215	971	0	183	0	0	0
RTOR Reduction (vph)	0	0	0	0	41	0	0	0	119	0	0	0
Lane Group Flow (vph)	158	286	0	0	783	0	971	0	64	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	8.0	41.9			29.7		28.1		28.1			
Effective Green, g (s)	8.0	41.9			29.7		28.1		28.1			
Actuated g/C Ratio	0.10	0.52			0.37		0.35		0.35			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	343	1854			1263		1206		556			
v/s Ratio Prot	c0.05	0.08			c0.23		c0.28					
v/s Ratio Perm									0.04			
v/c Ratio	0.46	0.15			0.62		0.81		0.12			
Uniform Delay, d1	34.0	9.9			20.5		23.5		17.5			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	1.0	0.2			2.3		4.0		0.1			
Delay (s)	34.9	10.0			22.8		27.5		17.6			
Level of Service	C	B			C		C		B			
Approach Delay (s)		18.9			22.8			25.9			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	79.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
12: Lightwave Avenue & Overland Avenue

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	92	12	18	116	161	5	49	1	123	88	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.91		1.00	1.00		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3478		1770	3231		1770	3529		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3478		1770	3231		1770	3529		1770	3339	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	100	13	20	126	175	5	53	1	134	96	58
RTOR Reduction (vph)	0	9	0	0	130	0	0	1	0	0	44	0
Lane Group Flow (vph)	55	104	0	20	171	0	5	53	0	134	110	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.1	13.8		0.7	11.4		0.5	4.5		6.8	10.8	
Effective Green, g (s)	3.1	13.8		0.7	11.4		0.5	4.5		6.8	10.8	
Actuated g/C Ratio	0.07	0.31		0.02	0.26		0.01	0.10		0.15	0.24	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	124	1081		28	830		20	358		271	812	
v/s Ratio Prot	c0.03	0.03		0.01	c0.05		0.00	0.02		c0.08	c0.03	
v/s Ratio Perm												
v/c Ratio	0.44	0.10		0.71	0.21		0.25	0.15		0.49	0.14	
Uniform Delay, d1	19.8	10.9		21.8	12.9		21.8	18.2		17.2	13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.0		52.5	0.1		2.4	0.2		0.5	0.1	
Delay (s)	20.7	10.9		74.2	13.1		24.1	18.4		17.7	13.2	
Level of Service	C	B		E	B		C	B		B	B	
Approach Delay (s)		14.1			16.9			18.9			15.3	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	44.4	Sum of lost time (s)	13.7	
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

Ex AM
9/24/2012

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	303	347	124	306	349	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3526	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	377	135	333	379	10
RTOR Reduction (vph)	0	226	0	0	2	0
Lane Group Flow (vph)	329	151	135	333	387	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.5	20.5	11.2	48.2	32.8	
Effective Green, g (s)	20.5	20.5	11.2	48.2	32.8	
Actuated g/C Ratio	0.26	0.26	0.14	0.60	0.41	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	454	406	248	2132	1446	
v/s Ratio Prot	c0.19		c0.08	0.09	c0.11	
v/s Ratio Perm		0.10				
v/c Ratio	0.72	0.37	0.54	0.16	0.27	
Uniform Delay, d1	27.2	24.5	32.0	7.0	15.6	
Progression Factor	1.00	1.00	0.86	0.77	1.00	
Incremental Delay, d2	5.7	0.6	2.4	0.2	0.5	
Delay (s)	32.8	25.0	30.0	5.6	16.1	
Level of Service	C	C	C	A	B	
Approach Delay (s)	28.7			12.6	16.1	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	0	419	0	0	0	0	324	53	51	645	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	0	455	0	0	0	0	352	58	55	701	0
RTOR Reduction (vph)	0	0	302	0	0	0	0	0	24	0	0	0
Lane Group Flow (vph)	0	115	153	0	0	0	0	352	34	55	701	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		11.6	11.6					47.4	47.4	5.5	57.1	
Effective Green, g (s)		11.6	11.6					47.4	47.4	5.5	57.1	
Actuated g/C Ratio		0.14	0.14					0.59	0.59	0.07	0.71	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		257	404					2097	938	122	2526	
v/s Ratio Prot								0.10		c0.03	c0.20	
v/s Ratio Perm		0.06	0.05						0.02			
v/c Ratio		0.45	0.38					0.17	0.04	0.45	0.28	
Uniform Delay, d1		31.3	30.9					7.4	6.8	35.8	4.1	
Progression Factor		1.00	1.00					1.00	1.00	0.85	0.64	
Incremental Delay, d2		1.2	0.6					0.2	0.1	2.5	0.3	
Delay (s)		32.5	31.5					7.5	6.9	32.8	2.9	
Level of Service		C	C					A	A	C	A	
Approach Delay (s)		31.7			0.0			7.5			5.0	
Approach LOS		C			A			A			A	

Intersection Summary				
HCM Average Control Delay	14.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	30	36	6	3	9	17	253	49	76	768	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.98		1.00	0.97	
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1720	1583	1770	1648		1770	3453		3433	3421	
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1720	1583	1770	1648		1770	3453		3433	3421	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	33	39	7	3	10	18	275	53	83	835	239
RTOR Reduction (vph)	0	0	34	0	10	0	0	22	0	0	34	0
Lane Group Flow (vph)	79	79	5	7	3	0	18	306	0	83	1040	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.4	6.4	6.4	0.8	0.8		0.5	21.7		2.5	23.7	
Effective Green, g (s)	6.4	6.4	6.4	0.8	0.8		0.5	21.7		2.5	23.7	
Actuated g/C Ratio	0.14	0.14	0.14	0.02	0.02		0.01	0.46		0.05	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	227	232	214	30	28		19	1581		181	1711	
v/s Ratio Prot	c0.05	0.05		c0.00	0.00		0.01	0.09		c0.02	c0.30	
v/s Ratio Perm			0.00									
v/c Ratio	0.35	0.34	0.02	0.23	0.11		0.95	0.19		0.46	0.61	
Uniform Delay, d1	18.6	18.6	17.8	23.0	23.0		23.4	7.6		21.8	8.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.9	0.0	4.0	1.8		179.6	0.1		1.8	0.6	
Delay (s)	19.5	19.5	17.8	27.0	24.7		203.0	7.7		23.6	9.1	
Level of Service	B	B	B	C	C		F	A		C	A	
Approach Delay (s)		19.2			25.5			17.9			10.2	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM Average Control Delay	12.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	37	19	15	31	63	35	260	25	98	758	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1843	1583		1833	1583	1770	3493		1770	3502	
Flt Permitted		0.91	1.00		0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1698	1583		1627	1583	1770	3493		1770	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	40	21	16	34	68	38	283	27	107	824	63
RTOR Reduction (vph)	0	0	19	0	0	60	0	7	0	0	5	0
Lane Group Flow (vph)	0	51	2	0	50	8	38	303	0	107	882	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		4.8	4.8		5.4	5.4	1.9	19.6		5.9	23.6	
Effective Green, g (s)		4.8	4.8		5.4	5.4	1.9	19.6		5.9	23.6	
Actuated g/C Ratio		0.11	0.11		0.12	0.12	0.04	0.43		0.13	0.52	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		179	167		193	188	74	1505		230	1816	
v/s Ratio Prot							0.02	0.09		c0.06	c0.25	
v/s Ratio Perm		0.03	0.00		c0.03	0.01						
v/c Ratio		0.28	0.01		0.26	0.04	0.51	0.20		0.47	0.49	
Uniform Delay, d1		18.8	18.2		18.2	17.8	21.3	8.1		18.3	7.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.0		0.3	0.0	2.5	0.1		0.5	0.3	
Delay (s)		19.1	18.2		18.5	17.8	23.8	8.2		18.9	7.4	
Level of Service		B	B		B	B	C	A		B	A	
Approach Delay (s)		18.8			18.1			9.9			8.6	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	10.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	21	2	0	0	41	343	5	6	691	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3532		1770	3489	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3532		1770	3489	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	23	2	0	0	45	373	5	7	751	78
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	24	1	0	0	2	0	45	378	0	7	824	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.2	3.2			0.8		2.6	31.4		0.6	29.4	
Effective Green, g (s)	3.2	3.2			0.8		2.6	31.4		0.6	29.4	
Actuated g/C Ratio	0.06	0.06			0.01		0.05	0.57		0.01	0.53	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	102	91			26		161	1998		19	1848	
v/s Ratio Prot	c0.01	0.00			c0.00		c0.01	0.11		0.00	c0.24	
v/s Ratio Perm												
v/c Ratio	0.24	0.01			0.08		0.28	0.19		0.37	0.45	
Uniform Delay, d1	25.0	24.7			27.0		25.5	5.9		27.3	8.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.0			0.5		0.3	0.1		4.4	0.4	
Delay (s)	25.4	24.7			27.4		25.9	6.0		31.6	8.5	
Level of Service	C	C			C		C	A		C	A	
Approach Delay (s)		25.1			27.4			8.1			8.7	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	9.1	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	11	14	23	13	7	131	397	82	34	598	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1805	1583	3433	3449		1770	3486	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583		1863	1583	3433	3449		1770	3486	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	12	15	25	14	8	142	432	89	37	650	72
RTOR Reduction (vph)	0	0	14	0	0	8	0	15	0	0	8	0
Lane Group Flow (vph)	0	38	1	0	39	0	142	506	0	37	714	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		2.1	2.1		2.1	2.1	4.1	24.1		1.7	21.7	
Effective Green, g (s)		2.1	2.1		2.1	2.1	4.1	24.1		1.7	21.7	
Actuated g/C Ratio		0.05	0.05		0.05	0.05	0.10	0.57		0.04	0.51	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		92	78		92	78	331	1956		71	1780	
v/s Ratio Prot							c0.04	0.15		0.02	c0.20	
v/s Ratio Perm		0.02	0.00		c0.02	0.00						
v/c Ratio		0.41	0.01		0.42	0.01	0.43	0.26		0.52	0.40	
Uniform Delay, d1		19.6	19.2		19.6	19.2	18.1	4.7		20.0	6.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		1.1	0.0	0.3	0.2		3.2	0.4	
Delay (s)		20.7	19.2		20.8	19.2	18.4	4.9		23.2	6.8	
Level of Service		C	B		C	B	B	A		C	A	
Approach Delay (s)		20.3			20.5			7.8			7.6	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	8.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	43.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
20: Lightwave Avenue & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	43	81	29	31	92	175	246	52	204	554	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1654		3433	3446		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1654		3433	3446		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	47	88	32	34	100	190	267	57	222	602	285
RTOR Reduction (vph)	0	0	56	0	87	0	0	17	0	0	0	169
Lane Group Flow (vph)	64	47	32	32	47	0	190	307	0	222	602	116
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	7.0	11.8	21.0	2.0	7.4		9.2	12.7		12.9	16.4	23.4
Effective Green, g (s)	7.0	11.8	21.0	2.0	7.4		9.2	12.7		12.9	16.4	23.4
Actuated g/C Ratio	0.12	0.21	0.37	0.03	0.13		0.16	0.22		0.22	0.29	0.41
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	418	382	578	62	213		549	761		397	1009	644
v/s Ratio Prot	0.02	0.03	0.01	c0.02	c0.03		0.06	c0.09		0.13	c0.17	c0.02
v/s Ratio Perm			0.01									0.05
v/c Ratio	0.15	0.12	0.06	0.52	0.22		0.35	0.40		0.56	0.60	0.18
Uniform Delay, d1	22.6	18.6	11.8	27.3	22.5		21.5	19.2		19.8	17.7	10.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.0	7.1	0.5		0.4	0.4		1.7	1.0	0.1
Delay (s)	22.8	18.8	11.9	34.4	23.0		21.9	19.5		21.5	18.7	11.0
Level of Service	C	B	B	C	C		C	B		C	B	B
Approach Delay (s)		17.0			25.2			20.4			17.3	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM Average Control Delay	18.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	45.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	3	79	9	0	5	261	570	40	12	455	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3505		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3505		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	3	86	10	0	5	284	620	43	13	495	113
RTOR Reduction (vph)	0	0	58	0	0	5	0	3	0	0	0	81
Lane Group Flow (vph)	30	3	28	0	10	0	284	660	0	13	495	32
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	1.9	1.9	16.9		0.8	0.8	15.0	29.0		0.5	14.5	14.5
Effective Green, g (s)	1.9	1.9	16.9		0.8	0.8	15.0	29.0		0.5	14.5	14.5
Actuated g/C Ratio	0.04	0.04	0.32		0.02	0.02	0.29	0.55		0.01	0.28	0.28
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	125	68	512		27	24	985	1943		17	981	439
v/s Ratio Prot	c0.01	0.00	0.02		c0.01		0.08	c0.19		0.01	c0.14	
v/s Ratio Perm			0.00			0.00						0.02
v/c Ratio	0.24	0.04	0.05		0.37	0.00	0.29	0.34		0.76	0.50	0.07
Uniform Delay, d1	24.5	24.3	12.2		25.5	25.4	14.5	6.4		25.8	15.9	13.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.3	0.0		8.4	0.1	0.2	0.1		106.9	0.4	0.1
Delay (s)	25.5	24.6	12.2		33.9	25.4	14.7	6.5		132.7	16.3	14.0
Level of Service	C	C	B		C	C	B	A		F	B	B
Approach Delay (s)		15.9			31.1			8.9			18.3	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM Average Control Delay	13.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	15.7	
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	178	245	392	584	838	519	95	277	66	91	270	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4616		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4616		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	266	426	635	911	564	103	301	72	99	293	102
RTOR Reduction (vph)	0	257	0	0	0	300	0	0	61	0	0	83
Lane Group Flow (vph)	193	435	0	635	911	264	103	301	11	99	293	19
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	14.0	15.4		22.9	24.5	32.1	5.7	12.6	12.6	7.6	14.6	14.6
Effective Green, g (s)	14.0	15.4		22.9	24.5	32.1	5.7	12.6	12.6	7.6	14.6	14.6
Actuated g/C Ratio	0.18	0.19		0.29	0.31	0.41	0.07	0.16	0.16	0.10	0.18	0.18
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	314	900		513	1577	1132	248	564	252	330	654	293
v/s Ratio Prot	0.11	0.09		c0.36	c0.18	0.02	0.03	c0.09		0.03	c0.08	
v/s Ratio Perm						0.07			0.01			0.01
v/c Ratio	0.61	0.48		1.24	0.58	0.23	0.42	0.53	0.05	0.30	0.45	0.06
Uniform Delay, d1	30.0	28.3		28.1	22.9	15.4	35.1	30.5	28.1	33.2	28.6	26.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.4		122.9	0.5	0.1	1.1	1.0	0.1	0.5	0.5	0.1
Delay (s)	33.6	28.7		151.0	23.4	15.5	36.2	31.5	28.2	33.7	29.1	26.7
Level of Service	C	C		F	C	B	D	C	C	C	C	C
Approach Delay (s)		29.7			59.7			32.0			29.5	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	45.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	9.8	
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	249	31	348	1917	459	4	13	35	81	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5000		1770	6222			1842	1583	1770	1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.75	1.00	
Satd. Flow (perm)	1770	5000		1770	6222			1750	1583	1389	1651	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	271	34	378	2084	499	4	14	38	88	7	22
RTOR Reduction (vph)	0	14	0	0	25	0	0	0	34	0	20	0
Lane Group Flow (vph)	114	291	0	378	2558	0	0	18	4	88	9	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	9.8	10.3		52.0	53.5			9.2	9.2	9.2	9.2	
Effective Green, g (s)	9.8	10.3		52.0	53.5			9.2	9.2	9.2	9.2	
Actuated g/C Ratio	0.11	0.12		0.59	0.61			0.10	0.10	0.10	0.10	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	197	586		1047	3787			183	166	145	173	
v/s Ratio Prot	c0.06	0.06		0.21	c0.41						0.01	
v/s Ratio Perm								0.01	0.00	c0.06		
v/c Ratio	0.58	0.50		0.36	0.68			0.10	0.02	0.61	0.05	
Uniform Delay, d1	37.1	36.4		9.3	11.4			35.6	35.3	37.6	35.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	0.7		0.2	0.5			0.2	0.1	7.0	0.1	
Delay (s)	41.2	37.0		9.5	11.9			35.8	35.4	44.6	35.6	
Level of Service	D	D		A	B			D	D	D	D	
Approach Delay (s)		38.2			11.6			35.5			42.4	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	15.4
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1535	58	152	1039	95	40	9	496	218	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5022		1770	1514	1504	3433	3137	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5022		1770	1514	1504	3433	3137	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1668	63	165	1129	103	43	10	539	237	16	50
RTOR Reduction (vph)	0	0	18	0	6	0	0	227	13	0	43	0
Lane Group Flow (vph)	54	1668	45	165	1226	0	43	47	262	237	23	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.5	73.2	83.9	18.8	83.9		6.4	10.5	29.3	13.3	17.7	
Effective Green, g (s)	7.5	73.2	83.9	18.8	83.9		6.4	10.5	29.3	13.3	17.7	
Actuated g/C Ratio	0.06	0.54	0.62	0.14	0.62		0.05	0.08	0.22	0.10	0.13	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	98	2757	984	478	3121		84	118	326	338	411	
v/s Ratio Prot	0.03	c0.33		0.05	0.24		0.02	0.03	c0.11	c0.07	0.01	
v/s Ratio Perm			0.03						0.06			
v/c Ratio	0.55	0.61	0.05	0.35	0.39		0.51	0.40	0.80	0.70	0.05	
Uniform Delay, d1	62.1	21.1	10.0	52.5	12.8		62.8	59.2	50.1	58.9	51.3	
Progression Factor	1.00	1.00	1.00	0.91	0.77		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	1.0	0.0	0.2	0.1		2.2	0.8	12.6	5.3	0.0	
Delay (s)	65.9	22.0	10.0	47.8	9.9		65.0	60.1	62.7	64.2	51.4	
Level of Service	E	C	A	D	A		E	E	E	E	D	
Approach Delay (s)		22.9			14.4			61.6			61.4	
Approach LOS		C			B			E			E	

Intersection Summary				
HCM Average Control Delay	28.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1429	820	0	799	749	0	0	255	0	0	52
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1553	891	0	868	814	0	0	277	0	0	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	1683			2445			2044	3236	777	1922	3313	434
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1683			2287			1773	3303	145	1616	3402	434
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	59	100	100	90
cM capacity (veh/h)	376			170			37	7	682	32	6	570

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	777	777	891	434	434	814	277	28	28
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	891	0	0	814	277	28	28
cSH	1700	1700	1700	1700	1700	1700	682	570	570
Volume to Capacity	0.46	0.46	0.52	0.26	0.26	0.48	0.41	0.05	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	49	4	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	13.8	11.6	11.6
Lane LOS							B	B	B
Approach Delay (s)	0.0			0.0			13.8	11.6	
Approach LOS							B	B	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	879	805	0	1333	547	215	0	277	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	955	875	0	1449	595	234	0	301	0	0	0
RTOR Reduction (vph)	0	0	170	0	0	116	0	0	266	0	0	0
Lane Group Flow (vph)	0	955	705	0	1449	479	117	117	35	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		108.7	108.7		108.7	108.7	15.5	15.5	15.5			
Effective Green, g (s)		108.7	108.7		108.7	108.7	15.5	15.5	15.5			
Actuated g/C Ratio		0.81	0.81		0.81	0.81	0.11	0.11	0.11			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		4094	1275		4094	1275	193	193	320			
v/s Ratio Prot		0.19			0.28		c0.07	0.07	0.01			
v/s Ratio Perm			c0.44			0.30						
v/c Ratio		0.23	0.55		0.35	0.38	0.61	0.61	0.11			
Uniform Delay, d1		3.2	4.6		3.6	3.7	56.8	56.8	53.6			
Progression Factor		0.55	3.80		0.27	1.78	1.00	1.00	1.00			
Incremental Delay, d2		0.1	1.5		0.2	0.8	5.3	5.3	0.1			
Delay (s)		1.8	19.0		1.2	7.3	62.1	62.1	53.7			
Level of Service		A	B		A	A	E	E	D			
Approach Delay (s)		10.1			3.0			57.4			0.0	
Approach LOS		B			A			E			A	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	769	214	91	1526	6	103	62	103	33	71	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	836	233	99	1659	7	112	67	112	36	77	273
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	42	0	0	99
Lane Group Flow (vph)	188	836	233	99	1659	5	112	67	70	36	77	174
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	11.6	84.8	135.0	12.8	85.9	11.1	8.5	11.1	84.8	7.1	9.9	85.9
Effective Green, g (s)	11.6	84.8	135.0	12.8	85.9	11.1	8.5	11.1	84.8	7.1	9.9	85.9
Actuated g/C Ratio	0.09	0.63	1.00	0.09	0.64	0.08	0.06	0.08	0.63	0.05	0.07	0.64
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	295	3194	1583	168	3236	130	216	153	994	93	137	1007
v/s Ratio Prot	c0.05	0.16		c0.06	c0.33		c0.03	0.04		0.02	c0.04	
v/s Ratio Perm			c0.15			0.00			0.04			0.11
v/c Ratio	0.64	0.26	0.15	0.59	0.51	0.04	0.52	0.44	0.07	0.39	0.56	0.17
Uniform Delay, d1	59.7	11.2	0.0	58.6	13.3	57.0	61.3	59.0	9.8	61.8	60.5	10.0
Progression Factor	0.89	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.2	0.2	5.2	0.6	0.1	2.1	2.0	0.1	2.7	5.2	0.4
Delay (s)	57.6	7.5	0.2	63.8	13.8	57.2	63.4	61.0	9.9	64.5	65.6	10.4
Level of Service	E	A	A	E	B	E	E	E	A	E	E	B
Approach Delay (s)		13.7			16.8			42.2			26.5	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	18.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Drive

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	705	28	41	877	28	88	3	28	58	3	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	5057		1770	5062			1777	1583		1778	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.68	1.00		0.58	1.00
Satd. Flow (perm)	1770	5057		1770	5062			1275	1583		1074	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	766	30	45	953	30	96	3	30	63	3	78
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	26	0	0	68
Lane Group Flow (vph)	105	794	0	45	981	0	0	99	4	0	66	10
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	12.1	81.7		7.2	76.8			14.1	14.1		14.1	14.1
Effective Green, g (s)	12.1	81.7		7.2	76.8			14.1	14.1		14.1	14.1
Actuated g/C Ratio	0.11	0.71		0.06	0.67			0.12	0.12		0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	186	3593		111	3381			156	194		132	194
v/s Ratio Prot	c0.06	0.16		0.03	c0.19							
v/s Ratio Perm								c0.08	0.00		0.06	0.01
v/c Ratio	0.56	0.22		0.41	0.29			0.63	0.02		0.50	0.05
Uniform Delay, d1	48.9	5.7		51.8	7.9			48.0	44.4		47.2	44.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	0.1		2.4	0.2			8.2	0.0		3.0	0.1
Delay (s)	52.8	5.9		54.3	8.1			56.2	44.4		50.1	44.6
Level of Service	D	A		D	A			E	D		D	D
Approach Delay (s)		11.3			10.1			53.4			47.1	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	15.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	795	46	151	739	23	165	28	101	53	20	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5044		3433	5085	1583	1770	3122		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5044		3433	5085	1583	1770	3122		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	864	50	164	803	25	179	30	110	58	22	134
RTOR Reduction (vph)	0	4	0	0	0	11	0	97	0	0	0	104
Lane Group Flow (vph)	63	910	0	164	803	14	179	43	0	58	22	30
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	6.1	54.6		11.8	60.2	60.2	19.8	15.8		34.1	30.1	30.1
Effective Green, g (s)	6.1	54.6		11.8	60.2	60.2	19.8	15.8		34.1	30.1	30.1
Actuated g/C Ratio	0.05	0.40		0.09	0.45	0.45	0.15	0.12		0.25	0.22	0.22
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	155	2040		300	2268	706	260	365		447	415	353
v/s Ratio Prot	0.02	c0.18		c0.05	0.16		c0.10	c0.01		c0.03	0.01	
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.41	0.45		0.55	0.35	0.02	0.69	0.12		0.13	0.05	0.08
Uniform Delay, d1	62.7	29.2		59.0	24.6	20.9	54.7	53.4		39.0	41.2	41.5
Progression Factor	1.00	1.00		0.90	0.44	0.15	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	0.7		2.0	0.4	0.0	7.4	0.1		0.1	0.2	0.5
Delay (s)	64.4	29.9		54.8	11.3	3.3	62.1	53.5		39.1	41.5	42.0
Level of Service	E	C		D	B	A	E	D		D	D	D
Approach Delay (s)		32.1			18.3			58.3			41.2	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM Average Control Delay	30.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	23.1	
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	774	117	227	398	44	228	501	191	389	381	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4985		3433	5009		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4985		3433	5009		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	284	841	127	247	433	48	248	545	208	423	414	170
RTOR Reduction (vph)	0	15	0	0	10	0	0	0	147	0	0	104
Lane Group Flow (vph)	284	953	0	247	471	0	248	545	61	423	414	66
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	16.4	35.8		16.6	36.1		15.0	39.4	39.4	23.6	48.2	48.2
Effective Green, g (s)	16.4	35.8		16.6	36.1		15.0	39.4	39.4	23.6	48.2	48.2
Actuated g/C Ratio	0.12	0.27		0.12	0.27		0.11	0.29	0.29	0.17	0.36	0.36
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	417	1322		422	1339		381	1033	462	600	1264	565
v/s Ratio Prot	0.08	c0.19		c0.07	0.09		c0.07	c0.15		c0.12	0.12	
v/s Ratio Perm									0.04			0.04
v/c Ratio	0.68	0.72		0.59	0.35		0.65	0.53	0.13	0.70	0.33	0.12
Uniform Delay, d1	56.8	45.1		55.9	40.0		57.5	40.0	35.2	52.4	31.6	29.1
Progression Factor	0.68	0.70		0.85	0.81		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	3.3		2.1	0.7		4.0	1.9	0.6	3.8	0.7	0.4
Delay (s)	42.8	35.0		49.6	33.0		61.4	41.9	35.8	56.2	32.3	29.6
Level of Service	D	C		D	C		E	D	D	E	C	C
Approach Delay (s)		36.7			38.7			45.5			41.9	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	65.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Clairemont Mesa Boulevard & Murphy Canyon Road

Ex PM
9/24/2012

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1350	83	194	610	116	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1467	90	211	663	126	460
RTOR Reduction (vph)	0	0	9	0	0	0	12
Lane Group Flow (vph)	0	1467	81	211	663	126	448
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		83.0	83.0	21.6	109.6	15.0	36.6
Effective Green, g (s)		83.0	83.0	21.6	109.6	15.0	36.6
Actuated g/C Ratio		0.61	0.61	0.16	0.81	0.11	0.27
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2176	973	283	4128	197	481
v/s Ratio Prot		c0.41		0.12	0.13	0.07	c0.15
v/s Ratio Perm			0.05				0.13
v/c Ratio		0.67	0.08	0.75	0.16	0.64	0.93
Uniform Delay, d1		17.1	10.6	54.1	2.7	57.4	48.0
Progression Factor		0.22	0.05	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6	0.2	10.2	0.1	6.7	24.8
Delay (s)		5.4	0.6	64.3	2.8	64.1	72.8
Level of Service		A	A	E	A	E	E
Approach Delay (s)		5.1			17.7	70.9	
Approach LOS		A			B	E	

Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: Clairemont Mesa Boulevard & I-15 SB Off-Ramp

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1209	564	207	585	0	0	0	0	777	7	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1607	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1607	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1314	613	225	636	0	0	0	0	845	8	238
RTOR Reduction (vph)	0	0	347	0	0	0	0	0	0	0	3	103
Lane Group Flow (vph)	0	1314	266	225	636	0	0	0	0	439	435	111
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		34.7	34.7	6.9	45.6					26.4	26.4	26.4
Effective Green, g (s)		34.7	34.7	6.9	45.6					26.4	26.4	26.4
Actuated g/C Ratio		0.43	0.43	0.09	0.57					0.33	0.33	0.33
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1535	1209	296	2017					555	530	496
v/s Ratio Prot		c0.37		c0.07	0.18					0.26	c0.27	
v/s Ratio Perm			0.10									0.07
v/c Ratio		0.86	0.22	0.76	0.32					0.79	0.82	0.22
Uniform Delay, d1		20.4	14.2	35.7	9.0					24.3	24.6	19.4
Progression Factor		1.00	1.00	0.91	0.68					1.00	1.00	1.00
Incremental Delay, d2		4.9	0.1	10.1	0.4					7.6	9.9	0.2
Delay (s)		25.3	14.3	42.5	6.5					31.9	34.5	19.6
Level of Service		C	B	D	A					C	C	B
Approach Delay (s)		21.8			15.9			0.0			30.5	
Approach LOS		C			B			A			C	

Intersection Summary				
HCM Average Control Delay	22.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	540	1446	0	0	515	86	277	0	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3464		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3464		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	1572	0	0	560	93	301	0	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	38	0	0	0
Lane Group Flow (vph)	587	1572	0	0	639	0	301	0	155	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	18.7	57.0			34.1		13.0		13.0			
Effective Green, g (s)	18.7	57.0			34.1		13.0		13.0			
Actuated g/C Ratio	0.23	0.71			0.43		0.16		0.16			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	802	2522			1477		558		257			
v/s Ratio Prot	c0.17	c0.44			0.18		0.09					
v/s Ratio Perm									c0.10			
v/c Ratio	0.73	0.62			0.43		0.54		0.60			
Uniform Delay, d1	28.3	5.9			16.1		30.8		31.1			
Progression Factor	0.82	0.56			1.00		1.00		1.00			
Incremental Delay, d2	2.0	0.7			0.9		1.0		4.0			
Delay (s)	25.2	4.0			17.1		31.8		35.1			
Level of Service	C	A			B		C		D			
Approach Delay (s)		9.8			17.1			33.1			0.0	
Approach LOS		A			B			C			A	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
12: Lightwave Avenue & Overland Avenue

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	65	0	6	113	174	46	122	18	204	31	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00		1.00	0.91		1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539		1770	3218		1770	3470		1770	3295	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539		1770	3218		1770	3470		1770	3295	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	71	0	7	123	189	50	133	20	222	34	29
RTOR Reduction (vph)	0	0	0	0	152	0	0	14	0	0	20	0
Lane Group Flow (vph)	67	71	0	7	160	0	50	139	0	222	43	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.9	13.7		0.6	10.4		3.4	7.0		13.7	17.3	
Effective Green, g (s)	3.9	13.7		0.6	10.4		3.4	7.0		13.7	17.3	
Actuated g/C Ratio	0.07	0.26		0.01	0.19		0.06	0.13		0.26	0.32	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	129	905		20	624		112	453		452	1063	
v/s Ratio Prot	c0.04	c0.02		0.00	c0.05		0.03	c0.04		c0.13	0.01	
v/s Ratio Perm												
v/c Ratio	0.52	0.08		0.35	0.26		0.45	0.31		0.49	0.04	
Uniform Delay, d1	23.9	15.2		26.3	18.3		24.2	21.1		17.0	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.0		3.8	0.2		1.0	0.4		0.3	0.0	
Delay (s)	25.4	15.2		30.1	18.6		25.2	21.5		17.3	12.5	
Level of Service	C	B		C	B		C	C		B	B	
Approach Delay (s)		20.2			18.8			22.4			16.2	
Approach LOS		C			B			C			B	

Intersection Summary				
HCM Average Control Delay	19.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	23.5	
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

Ex PM
9/24/2012

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	61	453	956	726	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3526	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	66	492	1039	789	20
RTOR Reduction (vph)	0	59	0	0	2	0
Lane Group Flow (vph)	88	7	492	1039	807	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	8.1	8.1	26.6	60.6	29.8	
Effective Green, g (s)	8.1	8.1	26.6	60.6	29.8	
Actuated g/C Ratio	0.10	0.10	0.33	0.76	0.37	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	179	160	589	2681	1313	
v/s Ratio Prot	c0.05		c0.28	0.29	c0.23	
v/s Ratio Perm		0.00				
v/c Ratio	0.49	0.04	0.84	0.39	0.61	
Uniform Delay, d1	34.0	32.4	24.7	3.3	20.4	
Progression Factor	1.00	1.00	0.88	0.01	1.00	
Incremental Delay, d2	2.1	0.1	2.6	0.1	2.2	
Delay (s)	36.1	32.6	24.3	0.1	22.6	
Level of Service	D	C	C	A	C	
Approach Delay (s)	34.6			7.9	22.6	
Approach LOS	C			A	C	

Intersection Summary				
HCM Average Control Delay	14.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	5	171	0	0	0	0	1253	389	415	372	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1776	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1776	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	5	186	0	0	0	0	1362	423	451	404	0
RTOR Reduction (vph)	0	0	156	0	0	0	0	0	269	0	0	0
Lane Group Flow (vph)	0	175	30	0	0	0	0	1362	154	451	404	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		12.7	12.7					29.2	29.2	22.6	56.0	
Effective Green, g (s)		12.7	12.7					29.2	29.2	22.6	56.0	
Actuated g/C Ratio		0.16	0.16					0.36	0.36	0.28	0.70	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		282	442					1292	578	500	2477	
v/s Ratio Prot								c0.38		c0.25	0.11	
v/s Ratio Perm		0.10	0.01						0.10			
v/c Ratio		0.62	0.07					1.05	0.27	0.90	0.16	
Uniform Delay, d1		31.4	28.6					25.4	17.9	27.6	4.1	
Progression Factor		1.00	1.00					1.00	1.00	0.69	0.16	
Incremental Delay, d2		4.2	0.1					40.6	1.1	16.8	0.1	
Delay (s)		35.6	28.7					66.0	19.0	35.9	0.8	
Level of Service		D	C					E	B	D	A	
Approach Delay (s)		32.0			0.0			54.9			19.3	
Approach LOS		C			A			D			B	

Intersection Summary				
HCM Average Control Delay	42.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	4	17	43	32	82	18	1219	4	14	447	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1687	1583	1770	1662		1770	3538		3433	3457	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1687	1583	1770	1662		1770	3538		3433	3457	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	371	4	18	47	35	89	20	1325	4	15	486	89
RTOR Reduction (vph)	0	0	15	0	84	0	0	0	0	0	19	0
Lane Group Flow (vph)	189	186	3	47	40	0	20	1329	0	15	556	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.5	12.5	12.5	3.7	3.7		1.3	33.2		0.5	32.4	
Effective Green, g (s)	12.5	12.5	12.5	3.7	3.7		1.3	33.2		0.5	32.4	
Actuated g/C Ratio	0.19	0.19	0.19	0.06	0.06		0.02	0.50		0.01	0.49	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	319	320	300	99	93		35	1782		26	1700	
v/s Ratio Prot	c0.11	0.11		c0.03	0.02		c0.01	c0.38		0.00	0.16	
v/s Ratio Perm			0.00									
v/c Ratio	0.59	0.58	0.01	0.47	0.43		0.57	0.75		0.58	0.33	
Uniform Delay, d1	24.4	24.3	21.7	30.2	30.1		32.0	13.0		32.6	10.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	2.7	0.0	3.6	3.2		20.6	1.7		27.4	0.1	
Delay (s)	27.3	27.0	21.7	33.7	33.3		52.6	14.7		60.0	10.3	
Level of Service	C	C	C	C	C		D	B		E	B	
Approach Delay (s)		26.9			33.4			15.3			11.5	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	17.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	56.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	14	70	92	52	167	28	905	20	37	479	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794	1583		1805	1583	1770	3528		1770	3515	
Flt Permitted		0.68	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1259	1583		1431	1583	1770	3528		1770	3515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	15	76	100	57	182	30	984	22	40	521	25
RTOR Reduction (vph)	0	0	61	0	0	144	0	2	0	0	4	0
Lane Group Flow (vph)	0	65	15	0	157	38	30	1004	0	40	542	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.5	10.5		11.1	11.1	1.8	26.3		1.7	26.2	
Effective Green, g (s)		10.5	10.5		11.1	11.1	1.8	26.3		1.7	26.2	
Actuated g/C Ratio		0.20	0.20		0.21	0.21	0.03	0.49		0.03	0.49	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		246	310		296	327	59	1728		56	1715	
v/s Ratio Prot							0.02	c0.28		c0.02	0.15	
v/s Ratio Perm		0.05	0.01		c0.11	0.02						
v/c Ratio		0.26	0.05		0.53	0.12	0.51	0.58		0.71	0.32	
Uniform Delay, d1		18.3	17.5		19.0	17.3	25.5	9.8		25.8	8.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		0.9	0.1	2.5	0.6		30.0	0.2	
Delay (s)		18.5	17.6		19.9	17.4	28.0	10.4		55.7	8.5	
Level of Service		B	B		B	B	C	B		E	A	
Approach Delay (s)		18.0			18.5			10.9			11.7	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	12.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	0	36	8	0	9	13	845	2	1	700	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1690		3433	3538		1770	3533	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1690		3433	3538		1770	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	39	9	0	10	14	918	2	1	761	9
RTOR Reduction (vph)	0	35	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	83	4	0	0	9	0	14	920	0	1	769	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Effective Green, g (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Actuated g/C Ratio	0.11	0.11			0.02		0.01	0.47		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	202	181			30		34	1678		17	1676	
v/s Ratio Prot	c0.05	0.00			c0.01		c0.00	c0.26		0.00	0.22	
v/s Ratio Perm												
v/c Ratio	0.41	0.02			0.31		0.41	0.55		0.06	0.46	
Uniform Delay, d1	20.9	20.0			24.6		25.0	9.5		24.9	9.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			2.1		2.9	0.8		0.5	0.5	
Delay (s)	21.4	20.0			26.7		27.9	10.3		25.4	9.5	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		21.0			26.7			10.5			9.5	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	11.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	39.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	6	78	151	30	66	38	618	23	4	685	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779	1583		1788	1583	3433	3520		1770	3517	
Flt Permitted		0.60	1.00		0.68	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1125	1583		1259	1583	3433	3520		1770	3517	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	7	85	164	33	72	41	672	25	4	745	33
RTOR Reduction (vph)	0	0	68	0	0	57	0	3	0	0	3	0
Lane Group Flow (vph)	0	128	17	0	197	15	41	694	0	4	775	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.0	10.0		10.0	10.0	1.2	24.3		0.6	23.7	
Effective Green, g (s)		10.0	10.0		10.0	10.0	1.2	24.3		0.6	23.7	
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.02	0.49		0.01	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		227	320		254	320	83	1728		21	1684	
v/s Ratio Prot							c0.01	0.20		0.00	c0.22	
v/s Ratio Perm		0.11	0.01		c0.16	0.01						
v/c Ratio		0.56	0.05		0.78	0.05	0.49	0.40		0.19	0.46	
Uniform Delay, d1		17.8	15.9		18.7	15.9	23.9	8.0		24.2	8.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		12.6	0.0	1.7	0.4		1.6	0.5	
Delay (s)		19.7	16.0		31.3	15.9	25.5	8.4		25.8	9.1	
Level of Service		B	B		C	B	C	A		C	A	
Approach Delay (s)		18.2			27.2			9.3			9.2	
Approach LOS		B			C			A			A	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
20: Lightwave Avenue & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	13	132	43	45	169	164	659	26	89	588	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1642		3433	3519		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1642		3433	3519		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	14	143	47	49	184	178	716	28	97	639	172
RTOR Reduction (vph)	0	0	106	0	156	0	0	3	0	0	0	86
Lane Group Flow (vph)	168	14	37	47	77	0	178	741	0	97	639	86
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	12.5	9.3	18.1	11.4	8.8		8.8	23.5		7.5	22.2	34.7
Effective Green, g (s)	12.5	9.3	18.1	11.4	8.8		8.8	23.5		7.5	22.2	34.7
Actuated g/C Ratio	0.18	0.13	0.26	0.16	0.13		0.13	0.34		0.11	0.32	0.50
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	615	248	410	289	207		433	1185		190	1126	787
v/s Ratio Prot	c0.05	0.01	0.01	0.03	c0.05		0.05	c0.21		c0.05	0.18	0.02
v/s Ratio Perm			0.01									0.03
v/c Ratio	0.27	0.06	0.09	0.16	0.37		0.41	0.63		0.51	0.57	0.11
Uniform Delay, d1	24.7	26.4	19.6	25.1	28.0		28.1	19.5		29.4	19.8	9.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.1	0.3	1.1		0.6	1.0		2.3	0.7	0.1
Delay (s)	25.0	26.5	19.7	25.4	29.1		28.7	20.5		31.7	20.5	9.4
Level of Service	C	C	B	C	C		C	C		C	C	A
Approach Delay (s)		22.7			28.5			22.1			19.6	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	0	285	16	4	16	103	611	4	15	754	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Flt Permitted	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	310	17	4	17	112	664	4	16	820	30
RTOR Reduction (vph)	0	0	220	0	0	16	0	0	0	0	0	13
Lane Group Flow (vph)	87	0	90	0	21	1	112	668	0	16	820	17
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	5.5		18.5		3.4	3.4	13.0	33.8		0.6	21.4	21.4
Effective Green, g (s)	5.5		18.5		3.4	3.4	13.0	33.8		0.6	21.4	21.4
Actuated g/C Ratio	0.09		0.29		0.05	0.05	0.21	0.53		0.01	0.34	0.34
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	298		462		96	85	704	1885		17	1195	534
v/s Ratio Prot	c0.03		0.04		c0.01		0.03	c0.19		0.01	c0.23	
v/s Ratio Perm			0.02			0.00						0.01
v/c Ratio	0.29		0.20		0.22	0.01	0.16	0.35		0.94	0.69	0.03
Uniform Delay, d1	27.1		16.9		28.7	28.4	20.7	8.5		31.4	18.1	14.1
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5		0.2		1.2	0.1	0.1	0.1		188.5	1.7	0.0
Delay (s)	27.7		17.1		29.9	28.5	20.8	8.6		219.9	19.8	14.1
Level of Service	C		B		C	C	C	A		F	B	B
Approach Delay (s)		19.4			29.2			10.4			23.3	
Approach LOS		B			C			B			C	

Intersection Summary				
HCM Average Control Delay	17.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	63.4	Sum of lost time (s)	15.7	
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	867	141	109	479	221	417	435	351	482	432	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	942	153	118	521	240	453	473	382	524	470	227
RTOR Reduction (vph)	0	18	0	0	0	127	0	0	160	0	0	178
Lane Group Flow (vph)	154	1077	0	118	521	113	453	473	222	524	470	49
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	9.8	29.2		10.6	30.2	47.1	18.3	22.9	22.9	16.9	21.6	21.6
Effective Green, g (s)	9.8	29.2		10.6	30.2	47.1	18.3	22.9	22.9	16.9	21.6	21.6
Actuated g/C Ratio	0.10	0.29		0.11	0.30	0.47	0.18	0.23	0.23	0.17	0.22	0.22
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	173	1452		187	1534	1311	628	810	362	580	764	342
v/s Ratio Prot	c0.09	c0.22		c0.07	0.10	0.01	c0.13	0.13		c0.15	c0.13	
v/s Ratio Perm						0.03			0.14			0.03
v/c Ratio	0.89	0.74		0.63	0.34	0.09	0.72	0.58	0.61	0.90	0.62	0.14
Uniform Delay, d1	44.6	32.0		42.9	27.2	14.6	38.5	34.4	34.6	40.8	35.5	31.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.9	2.1		6.8	0.1	0.0	4.1	1.1	3.1	17.4	1.5	0.2
Delay (s)	83.5	34.1		49.6	27.3	14.7	42.6	35.4	37.7	58.2	37.0	32.0
Level of Service	F	C		D	C	B	D	D	D	E	D	C
Approach Delay (s)		40.2			26.9			38.6			45.2	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	38.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	22.9	
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1731	21	47	685	62	24	7	484	433	13	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5076		1770	6329			1794	1583	1770	1615	
Flt Permitted	0.95	1.00		0.95	1.00			0.81	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5076		1770	6329			1500	1583	1369	1615	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	1882	23	51	745	67	26	8	526	471	14	109
RTOR Reduction (vph)	0	1	0	0	12	0	0	0	73	0	67	0
Lane Group Flow (vph)	48	1904	0	51	800	0	0	34	453	471	56	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	6.3	48.8		4.2	47.7			43.2	43.2	43.2	43.2	
Effective Green, g (s)	6.3	48.8		4.2	47.7			43.2	43.2	43.2	43.2	
Actuated g/C Ratio	0.06	0.43		0.04	0.42			0.38	0.38	0.38	0.38	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	99	2200		66	2681			575	607	525	620	
v/s Ratio Prot	0.03	c0.38		c0.03	0.13						0.03	
v/s Ratio Perm								0.02	0.29	c0.34		
v/c Ratio	0.48	0.87		0.77	0.30			0.06	0.75	0.90	0.09	
Uniform Delay, d1	51.6	28.9		53.7	21.4			21.9	30.0	32.6	22.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	3.8		42.0	0.1			0.0	5.0	17.8	0.1	
Delay (s)	55.3	32.8		95.7	21.5			21.9	34.9	50.4	22.2	
Level of Service	E	C		F	C			C	C	D	C	
Approach Delay (s)		33.3			25.9			34.1			44.6	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	33.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	9.3
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

ILV ANALYSIS WORKSHEETS

LINSCOTT LAW & GREENSPAN engineers

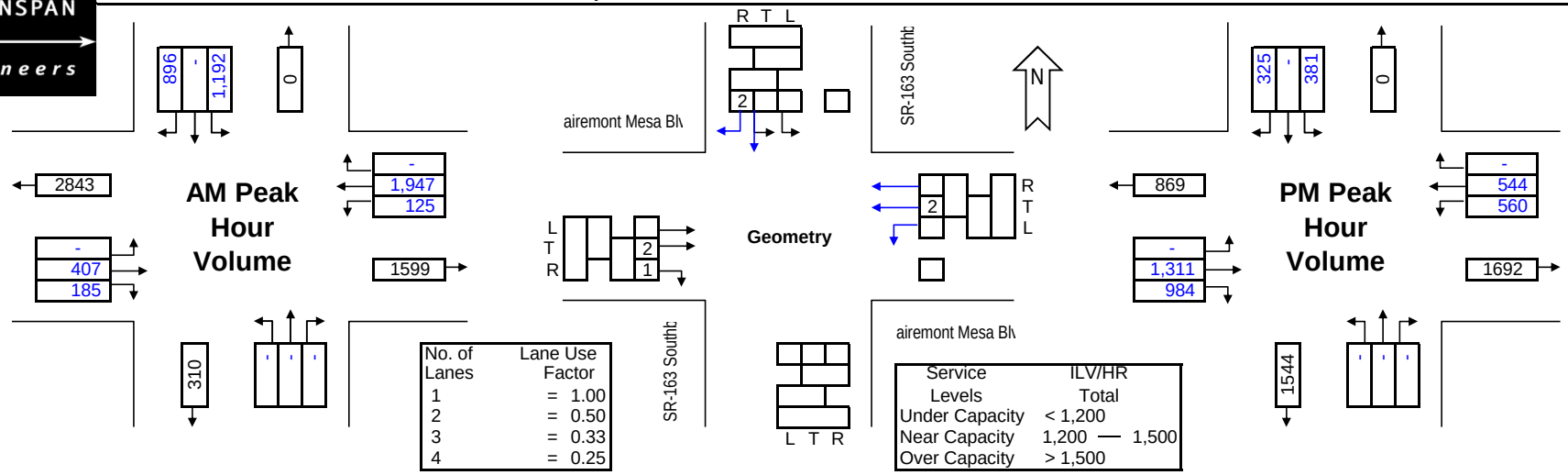
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Existing
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



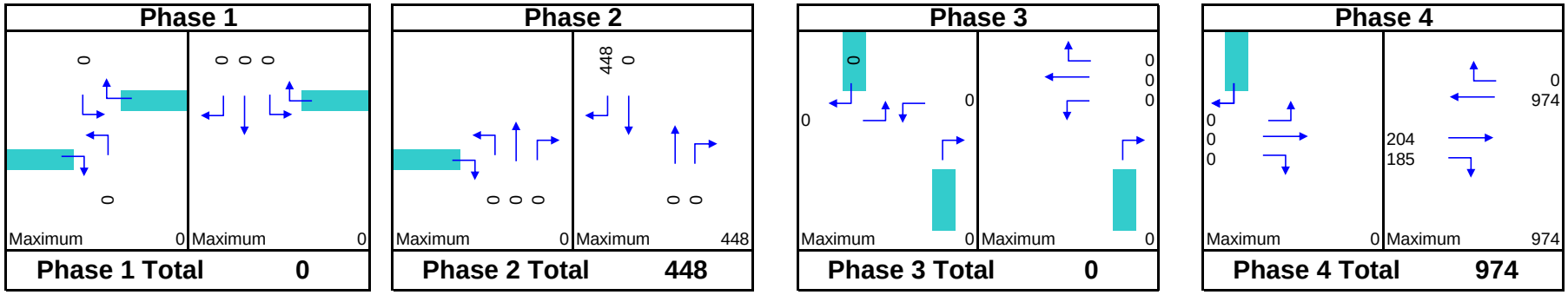
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1422

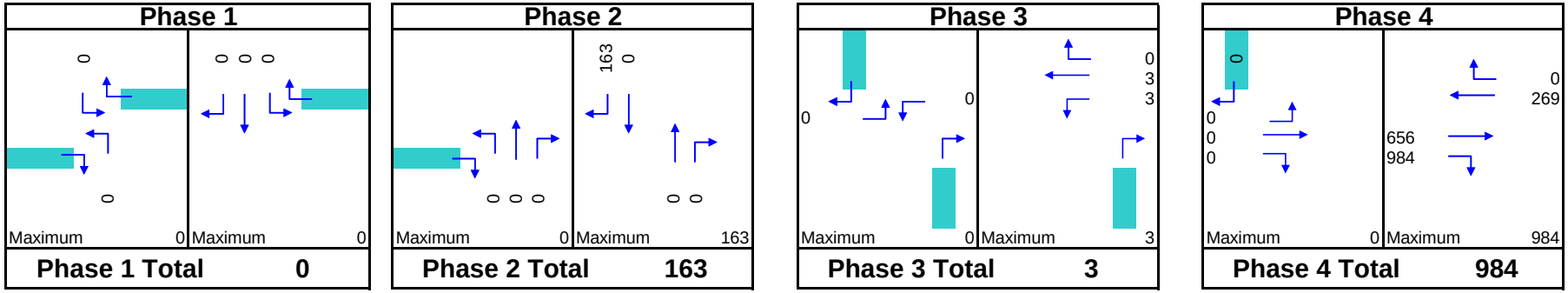
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1150

Service Level: **Under Capacity**



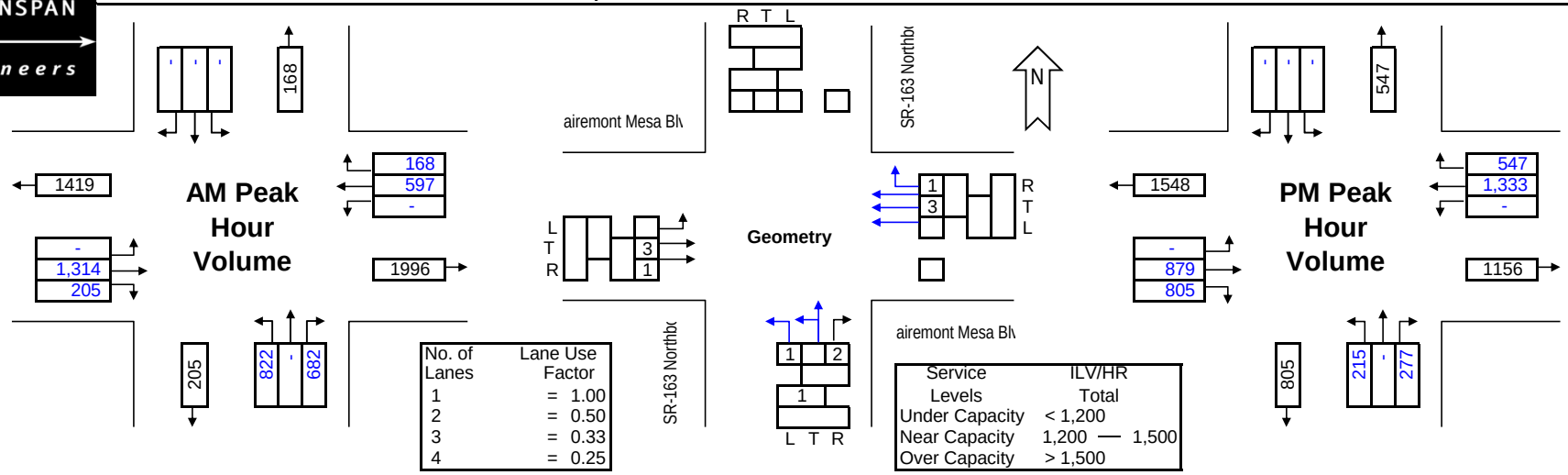
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Existing
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



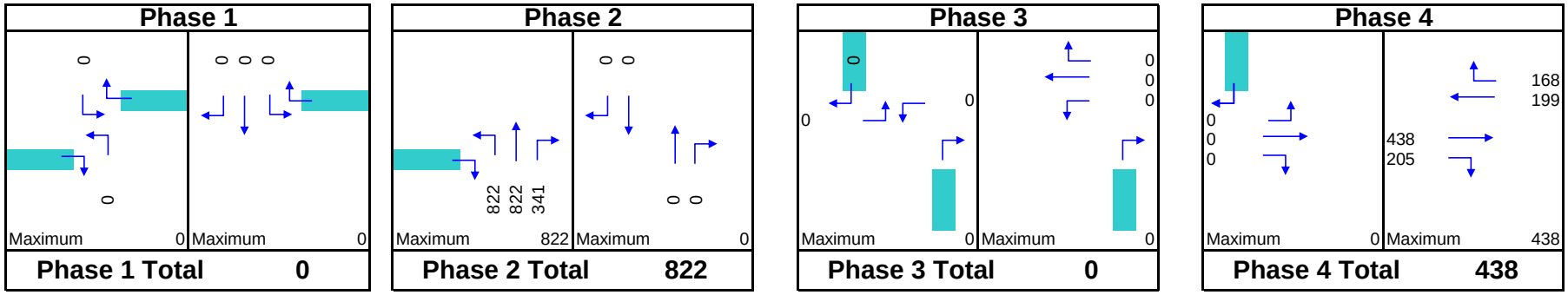
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1260

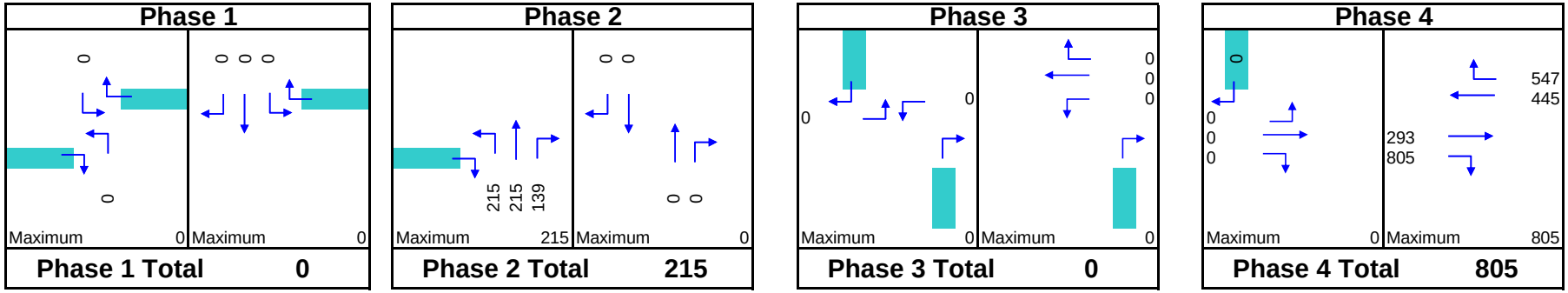
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1020

Service Level: **Under Capacity**



LINSCOTT LAW & GREENSPAN engineers

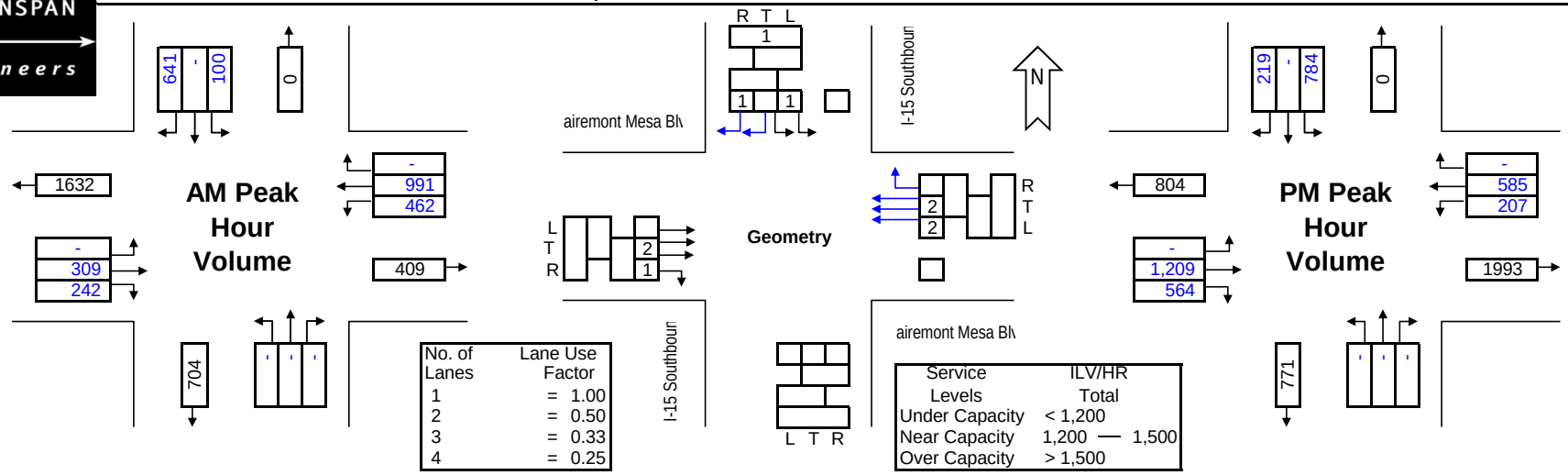
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Existing
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



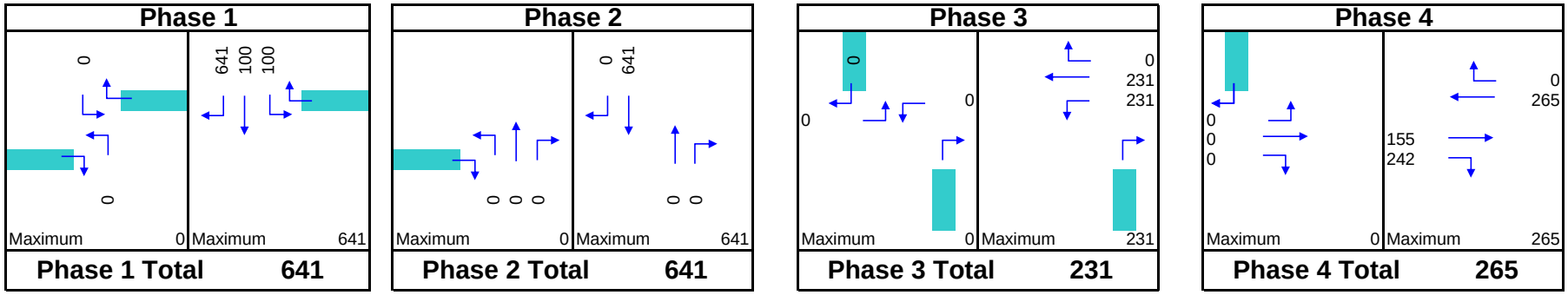
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1778

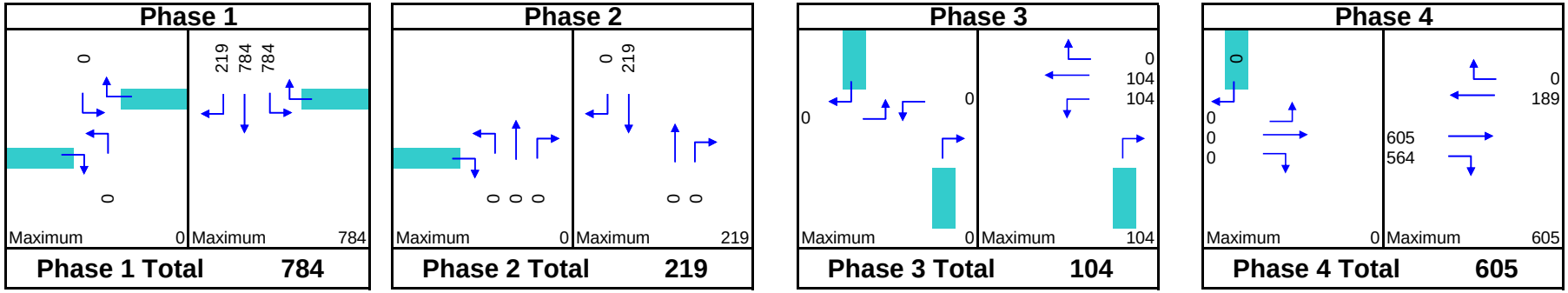
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1712

Service Level: **Over Capacity**



LINSCOTT LAW & GREENSPAN engineers

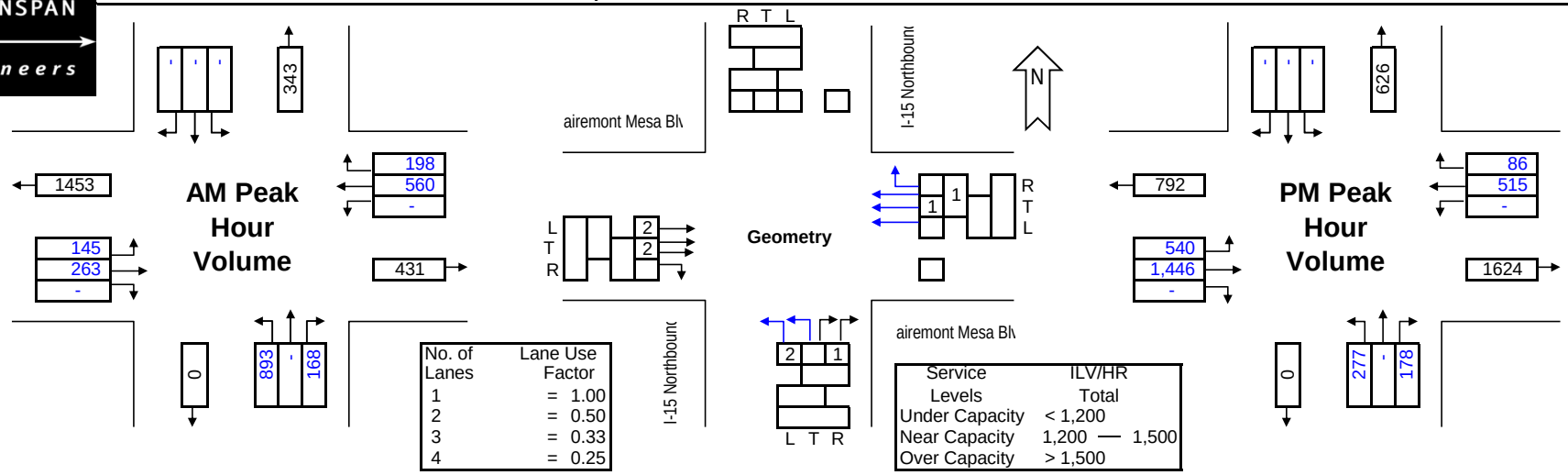
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Existing
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



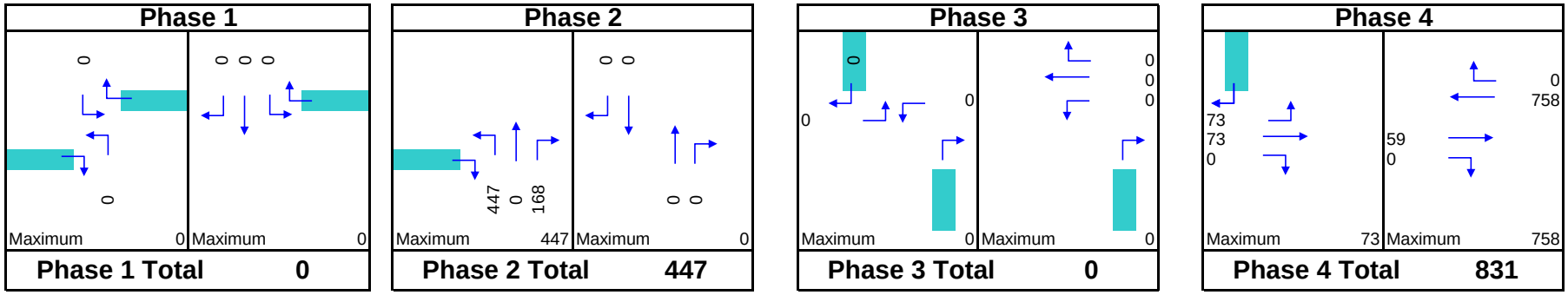
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1278

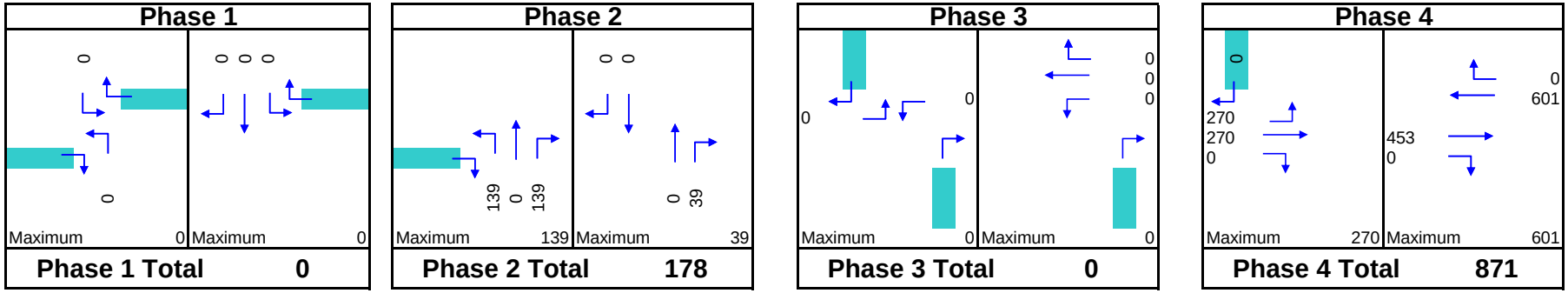
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1049

Service Level: **Under Capacity**



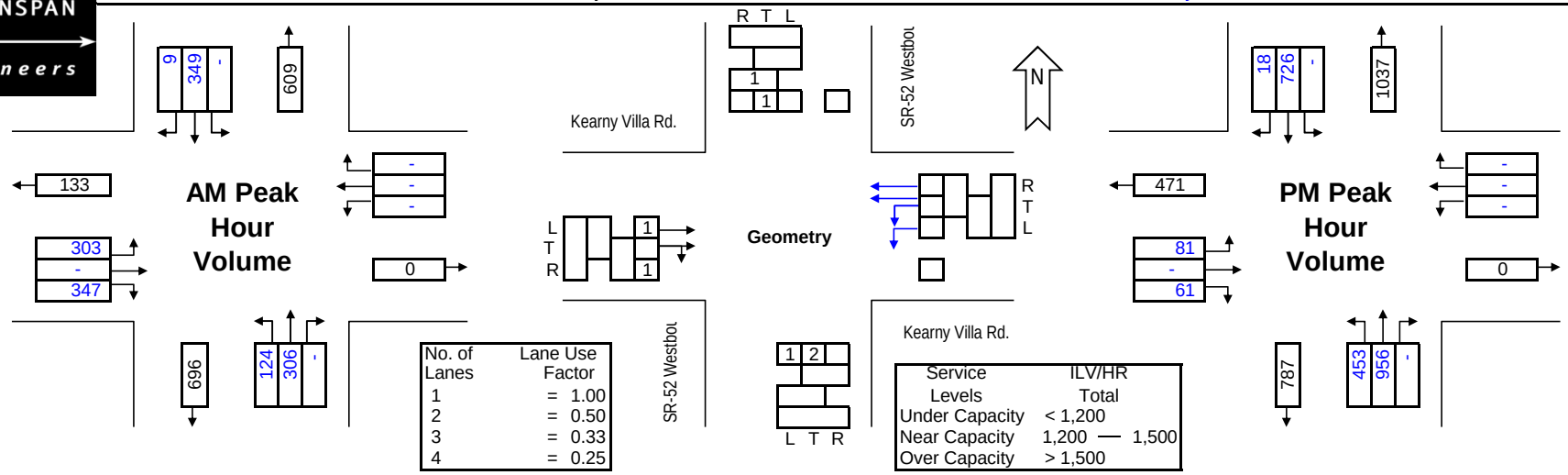
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Existing
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps N/S
at Kearny Villa Rd. E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 829

Service Level: **Under Capacity**

Phase 1

Maximum 0 | Maximum 0

Phase 1 Total 0

Phase 2

Maximum 124 | Maximum 358

Phase 2 Total 482

Phase 3

Maximum 0 | Maximum 0

Phase 3 Total 0

Phase 4

Maximum 303 | Maximum 44

Phase 4 Total 347

PM Peak Hour Analysis

Total Crictical Lane Volume 1278

Service Level: **Near Capacity**

Phase 1

Maximum 0 | Maximum 0

Phase 1 Total 0

Phase 2

Maximum 453 | Maximum 744

Phase 2 Total 1197

Phase 3

Maximum 0 | Maximum 0

Phase 3 Total 0

Phase 4

Maximum 81 | Maximum 0

Phase 4 Total 81

LINSCOTT LAW & GREENSPAN engineers

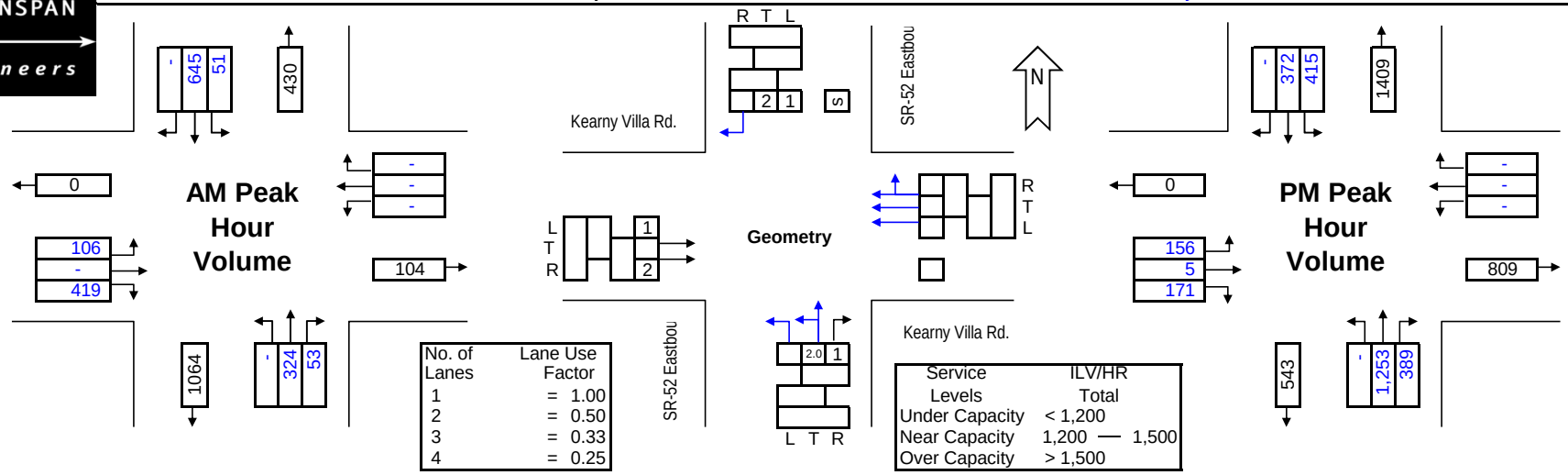
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION:
COMPUTED BY: LC

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps at Kearny Villa Rd.

N/S
E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

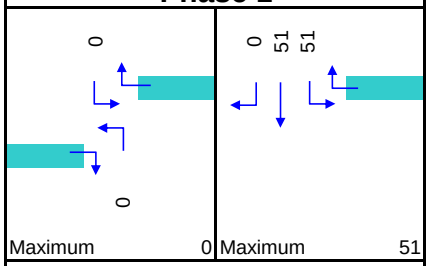
Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 695

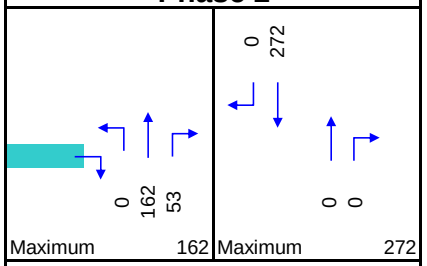
Service Level: **Under Capacity**

Phase 1



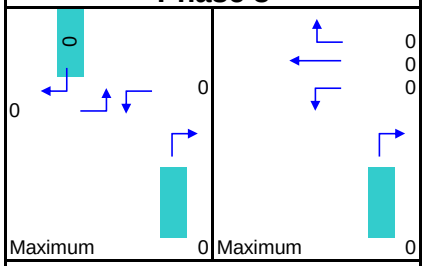
Phase 1 Total 51

Phase 2



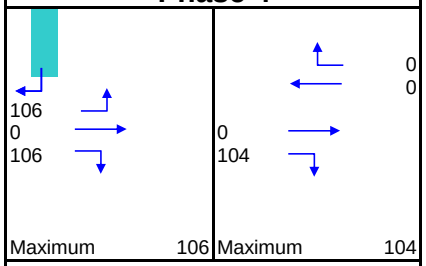
Phase 2 Total 434

Phase 3



Phase 3 Total 0

Phase 4



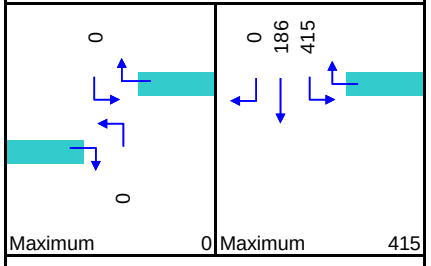
Phase 4 Total 210

PM Peak Hour Analysis

Total Crictical Lane Volume 1198

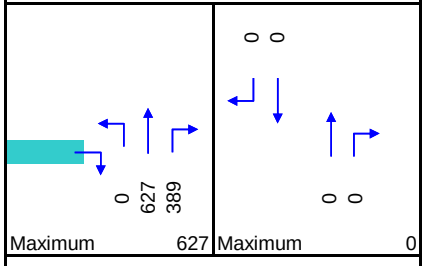
Service Level: **Under Capacity**

Phase 1



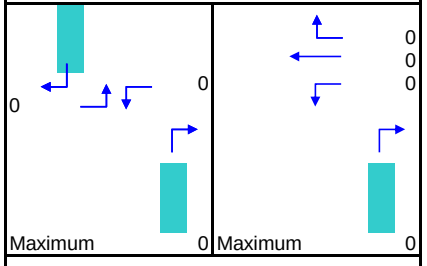
Phase 1 Total 415

Phase 2



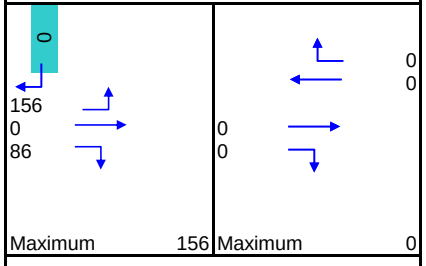
Phase 2 Total 627

Phase 3



Phase 3 Total 0

Phase 4



Phase 4 Total 156

Instructions also located: S:\KOK\ILV Anlaysis\1_ILV Sheet.dotx

1 – ILV Single Intersection Spreadsheet
(Contact Person: KC Yellapu)

1.0 Single Intersection Spreadsheet

Things to remember:

- For every new project, always use a fresh sheet from S:\KOK\ILV folder. The sheet will be constantly updated.
- ILV analysis can be done in several ways. This methodology is mostly based on the previous group discussion. Contact KC, if you wish to revise the methodology.
- The sheet is still not been thoroughly checked for errors, always review the numbers and report any discrepancies.
- Report any specific comments from Caltrans or other agencies.

Following information should be entered in the spreadsheet:

1.1 Information

Condition: Scenario (Existing or Existing + Project……..)
Computed By:
Date:
Project Number:
Location: North-South Street on the top box and then East-West Street below

1.2 Traffic Volumes

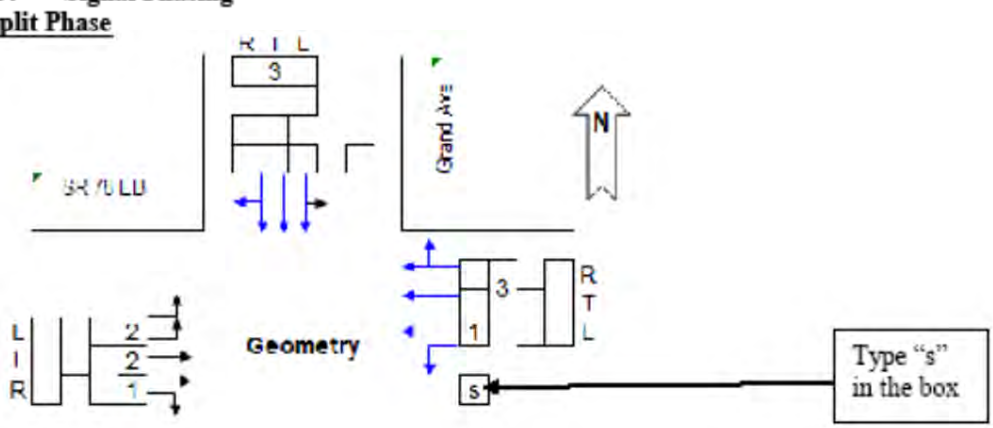
From PH Sheet

1.3 Lane Configuration

As shown in the cheat sheet

1.4 Signal Phasing

Split Phase



Overlap Phase or Right Turn Adjustments

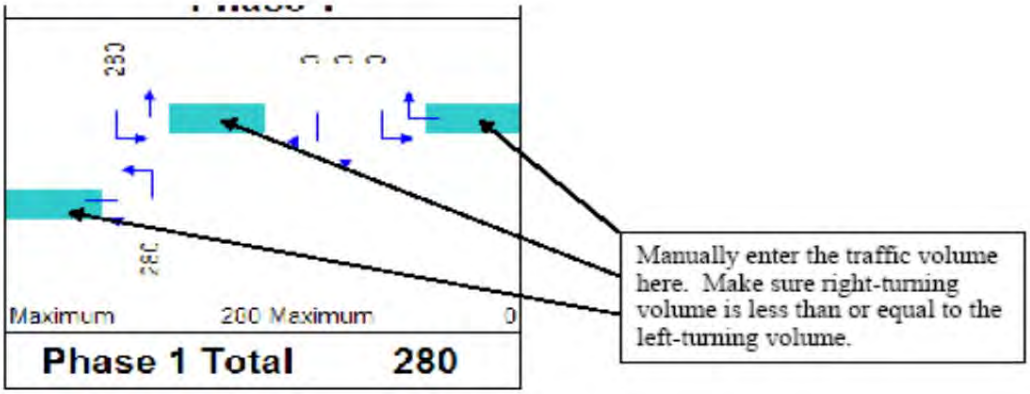


Table X
Existing ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	1,422	Near Capacity
	PM	1,150	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,260	Near Capacity
	PM	1,020	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	1,778	Over Capacity
	PM	1,712	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,278	Near Capacity
	PM	1,049	Under Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	829	Under Capacity
	PM	1,278	Near Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	695	Under Capacity
	PM	1,198	Under Capacity

APPENDIX D

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS AND ARTERIAL ANALYSIS WORKSHEETS - EXISTING + PROJECT PHASE I

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	604	23	268	1552	196	22	10	127	104	13	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.87	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5000		1770	1543	1504	3433	3166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5000		1770	1543	1504	3433	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	657	25	291	1687	213	24	11	138	113	14	33
RTOR Reduction (vph)	0	0	9	0	9	0	0	62	60	0	30	0
Lane Group Flow (vph)	35	657	16	291	1891	0	24	14	13	113	17	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	4.7	60.9	70.5	14.9	70.5		5.0	5.4	20.3	9.6	10.3	
Effective Green, g (s)	4.7	60.9	70.5	14.9	70.5		5.0	5.4	20.3	9.6	10.3	
Actuated g/C Ratio	0.04	0.55	0.64	0.14	0.64		0.05	0.05	0.18	0.09	0.09	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	76	2815	1015	465	3205		80	76	338	300	296	
v/s Ratio Prot	0.02	0.13		c0.08	c0.38		0.01	c0.01	0.01	c0.03	0.01	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.46	0.23	0.02	0.63	0.59		0.30	0.19	0.04	0.38	0.06	
Uniform Delay, d1	51.4	12.6	7.2	44.9	11.4		50.8	50.2	36.8	47.4	45.4	
Progression Factor	1.00	1.00	1.00	0.94	0.75		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.0	1.9	0.3		0.8	0.4	0.0	0.3	0.0	
Delay (s)	53.0	12.8	7.2	44.3	8.9		51.6	50.6	36.9	47.7	45.5	
Level of Service	D	B	A	D	A		D	D	D	D	D	
Approach Delay (s)		14.5			13.6			45.0			47.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	17.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8	
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	605	230	0	1033	398	0	0	915	0	0	168
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	658	250	0	1123	433	0	0	995	0	0	183
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.97			0.94			0.95	0.95	0.94	0.95	0.95	0.97
vC, conflicting volume	1555			908			1402	2213	329	2446	2030	561
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1505			764			1164	2016	146	2261	1824	477
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	65
cM capacity (veh/h)	426			790			92	55	819	0	73	516

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	329	329	250	561	561	433	995	91	91
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	250	0	0	433	995	91	91
cSH	1700	1700	1700	1700	1700	1700	819	516	516
Volume to Capacity	0.19	0.19	0.15	0.33	0.33	0.25	1.21	0.18	0.18
Queue Length 95th (ft)	0	0	0	0	0	0	830	16	16
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	126.6	13.5	13.5
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			126.6	13.5	
Approach LOS							F	B	

Intersection Summary			
Average Delay	35.3		
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Proj Ph I (Year 2017) AM
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1315	205	0	610	170	822	0	685	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1429	223	0	663	185	893	0	745	0	0	0
RTOR Reduction (vph)	0	0	111	0	0	92	0	0	13	0	0	0
Lane Group Flow (vph)	0	1429	112	0	663	93	446	447	732	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		55.1	55.1		55.1	55.1	44.1	44.1	44.1			
Effective Green, g (s)		55.1	55.1		55.1	55.1	44.1	44.1	44.1			
Actuated g/C Ratio		0.50	0.50		0.50	0.50	0.40	0.40	0.40			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2547	793		2547	793	674	674	1117			
v/s Ratio Prot		c0.28			0.13		0.27	c0.27	0.26			
v/s Ratio Perm			0.07			0.06						
v/c Ratio		0.56	0.14		0.26	0.12	0.66	0.66	0.66			
Uniform Delay, d1		19.1	14.7		15.8	14.6	26.9	26.9	26.8			
Progression Factor		0.86	0.36		0.69	0.78	1.00	1.00	1.00			
Incremental Delay, d2		0.9	0.4		0.2	0.3	2.4	2.5	1.4			
Delay (s)		17.3	5.6		11.1	11.7	29.3	29.4	28.2			
Level of Service		B	A		B	B	C	C	C			
Approach Delay (s)		15.7			11.2			28.8			0.0	
Approach LOS		B			B			C			A	

Intersection Summary				
HCM Average Control Delay	20.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Proj Ph I (Year 2017) AM
4: Clairemont Mesa Boulevard & Kearny Villa Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	1085	758	51	567	9	86	51	86	22	43	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	1179	824	55	616	10	93	55	93	24	47	138
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	33	0	0	49
Lane Group Flow (vph)	170	1179	824	55	616	1	93	55	60	24	47	89
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	4.9	70.9	110.0	4.9	70.8	10.2	8.1	10.2	70.9	4.8	7.1	70.8
Effective Green, g (s)	4.9	70.9	110.0	4.9	70.8	10.2	8.1	10.2	70.9	4.8	7.1	70.8
Actuated g/C Ratio	0.04	0.64	1.00	0.04	0.64	0.09	0.07	0.09	0.64	0.04	0.06	0.64
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	3278	1583	79	3273	147	253	173	1020	77	120	1019
v/s Ratio Prot	c0.05	0.23		0.03	0.12		0.03	0.03		0.01	0.03	
v/s Ratio Perm			c0.52			0.00			0.04			0.06
v/c Ratio	1.11	0.36	0.52	0.70	0.19	0.01	0.37	0.32	0.06	0.31	0.39	0.09
Uniform Delay, d1	52.5	9.0	0.0	51.8	7.9	45.3	48.5	46.6	7.2	51.0	49.4	7.4
Progression Factor	0.99	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.4	0.3	1.0	23.4	0.1	0.0	0.9	1.1	0.1	2.3	2.1	0.2
Delay (s)	151.6	6.4	1.0	75.2	8.1	45.3	49.4	47.7	7.3	53.3	51.5	7.6
Level of Service	F	A	A	E	A	D	D	D	A	D	D	A
Approach Delay (s)		15.7			14.0			32.8			22.7	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM Average Control Delay	17.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.4	
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	702	98	61	540	79	37	2	36	44	1	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	4991		1770	4988			1778	1583		1776	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.70	1.00
Satd. Flow (perm)	1770	4991		1770	4988			1305	1583		1303	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	763	107	66	587	86	40	2	39	48	1	36
RTOR Reduction (vph)	0	11	0	0	12	0	0	0	36	0	0	33
Lane Group Flow (vph)	234	859	0	66	661	0	0	42	3	0	49	3
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	18.1	68.5		7.8	58.2			7.7	7.7		7.7	7.7
Effective Green, g (s)	18.1	68.5		7.8	58.2			7.7	7.7		7.7	7.7
Actuated g/C Ratio	0.19	0.71		0.08	0.61			0.08	0.08		0.08	0.08
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	334	3561		144	3024			105	127		105	127
v/s Ratio Prot	c0.13	c0.17		0.04	0.13							
v/s Ratio Perm								0.03	0.00		c0.04	0.00
v/c Ratio	0.70	0.24		0.46	0.22			0.40	0.02		0.47	0.02
Uniform Delay, d1	36.4	4.8		42.1	8.6			42.0	40.7		42.2	40.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.5	0.2		2.3	0.2			2.5	0.1		3.3	0.1
Delay (s)	42.9	4.9		44.4	8.7			44.4	40.8		45.4	40.8
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		13.0			11.9			42.7			43.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	132	656	69	116	559	39	101	43	38	28	16	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5013		3433	5085	1583	1770	3292		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5013		3433	5085	1583	1770	3292		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	713	75	126	608	42	110	47	41	30	17	49
RTOR Reduction (vph)	0	11	0	0	0	30	0	24	0	0	0	33
Lane Group Flow (vph)	143	777	0	126	608	12	110	64	0	30	17	16
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	9.7	32.8		8.9	31.9	31.9	13.5	45.6		4.0	36.1	36.1
Effective Green, g (s)	9.7	32.8		8.9	31.9	31.9	13.5	45.6		4.0	36.1	36.1
Actuated g/C Ratio	0.09	0.30		0.08	0.29	0.29	0.12	0.41		0.04	0.33	0.33
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	303	1495		278	1475	459	217	1365		64	611	520
v/s Ratio Prot	0.04	c0.15		0.04	c0.12		c0.06	c0.02		c0.02	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.47	0.52		0.45	0.41	0.03	0.51	0.05		0.47	0.03	0.03
Uniform Delay, d1	47.7	32.1		48.2	31.5	27.9	45.1	19.2		52.0	25.1	25.1
Progression Factor	1.00	1.00		0.79	0.49	0.41	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	1.3		1.1	0.8	0.1	1.9	0.0		5.3	0.1	0.1
Delay (s)	48.9	33.4		39.1	16.1	11.5	47.0	19.2		57.3	25.1	25.2
Level of Service	D	C		D	B	B	D	B		E	C	C
Approach Delay (s)		35.7			19.6			34.7			35.2	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	238	326	176	464	570	199	109	200	67	184	449	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4818		3433	4888		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4818		3433	4888		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	354	191	504	620	216	118	217	73	200	488	136
RTOR Reduction (vph)	0	90	0	0	56	0	0	0	51	0	0	93
Lane Group Flow (vph)	259	455	0	504	780	0	118	217	22	200	488	43
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	12.5	33.6		16.6	37.8		7.8	33.0	33.0	7.2	32.6	32.6
Effective Green, g (s)	12.5	33.6		16.6	37.8		7.8	33.0	33.0	7.2	32.6	32.6
Actuated g/C Ratio	0.11	0.31		0.15	0.34		0.07	0.30	0.30	0.07	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	390	1472		518	1680		243	1062	475	225	1049	469
v/s Ratio Prot	c0.08	0.09		c0.15	c0.16		0.03	0.06		c0.06	c0.14	
v/s Ratio Perm									0.01			0.03
v/c Ratio	0.66	0.31		0.97	0.46		0.49	0.20	0.05	0.89	0.47	0.09
Uniform Delay, d1	46.7	29.3		46.5	28.2		49.2	28.7	27.3	51.0	31.6	28.0
Progression Factor	0.57	0.11		0.97	1.02		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.5		31.9	0.9		1.5	0.4	0.2	31.7	1.5	0.4
Delay (s)	30.3	3.8		76.9	29.5		50.7	29.1	27.5	82.7	33.1	28.4
Level of Service	C	A		E	C		D	C	C	F	C	C
Approach Delay (s)		12.3			47.3			35.1			44.3	
Approach LOS		B			D			D			D	

Intersection Summary				
HCM Average Control Delay	36.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.7	
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	614	64	321	1205	24	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	667	70	349	1310	26	130
RTOR Reduction (vph)	0	24	0	0	0	94
Lane Group Flow (vph)	667	46	349	1310	26	36
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	65.2	72.4	23.6	93.3	7.2	30.8
Effective Green, g (s)	65.2	72.4	23.6	93.3	7.2	30.8
Actuated g/C Ratio	0.59	0.66	0.21	0.85	0.07	0.28
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3014	1105	737	4313	116	892
v/s Ratio Prot	0.13	0.00	c0.10	c0.26	c0.01	0.01
v/s Ratio Perm		0.03				0.00
v/c Ratio	0.22	0.04	0.47	0.30	0.22	0.04
Uniform Delay, d1	10.5	6.6	37.8	1.7	48.8	28.8
Progression Factor	0.69	0.04	0.96	0.96	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.5	0.2	1.0	0.0
Delay (s)	7.4	0.3	36.9	1.8	49.7	28.9
Level of Service	A	A	D	A	D	C
Approach Delay (s)	6.7			9.2	32.3	
Approach LOS	A			A	C	

Intersection Summary				
HCM Average Control Delay	9.9	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.9	
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	546	117	382	1264	51	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	593	127	415	1374	55	76
RTOR Reduction (vph)	0	0	32	0	0	0	24
Lane Group Flow (vph)	0	593	95	415	1374	55	52
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		56.2	56.2	30.7	91.9	7.7	38.4
Effective Green, g (s)		56.2	56.2	30.7	91.9	7.7	38.4
Actuated g/C Ratio		0.51	0.51	0.28	0.84	0.07	0.35
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1808	809	494	4248	124	553
v/s Ratio Prot		0.17		c0.23	c0.27	c0.03	0.03
v/s Ratio Perm			0.06				0.01
v/c Ratio		0.33	0.12	0.84	0.32	0.44	0.09
Uniform Delay, d1		15.8	14.0	37.3	2.0	49.1	24.1
Progression Factor		0.69	0.85	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.3	12.2	0.2	2.5	0.1
Delay (s)		11.3	12.2	49.5	2.2	51.6	24.2
Level of Service		B	B	D	A	D	C
Approach Delay (s)		11.5			13.2	35.7	
Approach LOS		B			B	D	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.7
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	323	293	462	1003	0	0	0	0	99	1	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1447	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1447	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	351	318	502	1090	0	0	0	0	108	1	700
RTOR Reduction (vph)	0	0	221	0	0	0	0	0	0	0	44	44
Lane Group Flow (vph)	0	351	97	502	1090	0	0	0	0	97	311	313
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		24.7	30.5	32.8	61.5					30.5	30.5	30.5
Effective Green, g (s)		24.7	30.5	32.8	61.5					30.5	30.5	30.5
Actuated g/C Ratio		0.25	0.30	0.33	0.62					0.30	0.30	0.30
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		874	850	1126	2176					513	441	459
v/s Ratio Prot		0.10		0.15	c0.31					0.06	c0.22	
v/s Ratio Perm			0.03									0.21
v/c Ratio		0.40	0.11	0.45	0.50					0.19	0.71	0.68
Uniform Delay, d1		31.5	25.0	26.4	10.7					25.6	30.8	30.5
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	0.3	0.8					0.2	5.1	4.2
Delay (s)		31.8	25.1	26.7	11.5					25.8	35.9	34.7
Level of Service		C	C	C	B					C	D	C
Approach Delay (s)		28.6			16.3			0.0			34.1	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	265	0	0	561	198	904	0	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3401		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3401		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	288	0	0	610	215	983	0	183	0	0	0
RTOR Reduction (vph)	0	0	0	0	42	0	0	0	118	0	0	0
Lane Group Flow (vph)	170	288	0	0	783	0	983	0	65	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	8.4	41.7			29.1		28.3		28.3			
Effective Green, g (s)	8.4	41.7			29.1		28.3		28.3			
Actuated g/C Ratio	0.11	0.52			0.36		0.35		0.35			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	360	1845			1237		1214		560			
v/s Ratio Prot	c0.05	0.08			c0.23		c0.29					
v/s Ratio Perm									0.04			
v/c Ratio	0.47	0.16			0.63		0.81		0.12			
Uniform Delay, d1	33.7	10.0			21.0		23.4		17.4			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	1.0	0.2			2.5		4.1		0.1			
Delay (s)	34.7	10.2			23.5		27.5		17.5			
Level of Service	C	B			C		C		B			
Approach Delay (s)		19.3			23.5			25.9			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Lightwave Avenue & Overland Avenue

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	93	12	18	121	161	5	49	1	123	88	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.91		1.00	1.00		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3479		1770	3237		1770	3529		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3479		1770	3237		1770	3529		1770	3339	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	101	13	20	132	175	5	53	1	134	96	58
RTOR Reduction (vph)	0	9	0	0	130	0	0	1	0	0	44	0
Lane Group Flow (vph)	55	105	0	20	177	0	5	53	0	134	110	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.1	13.9		0.7	11.5		0.5	4.5		6.8	10.8	
Effective Green, g (s)	3.1	13.9		0.7	11.5		0.5	4.5		6.8	10.8	
Actuated g/C Ratio	0.07	0.31		0.02	0.26		0.01	0.10		0.15	0.24	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	123	1087		28	837		20	357		270	810	
v/s Ratio Prot	c0.03	0.03		0.01	c0.05		0.00	0.02		c0.08	c0.03	
v/s Ratio Perm												
v/c Ratio	0.45	0.10		0.71	0.21		0.25	0.15		0.50	0.14	
Uniform Delay, d1	19.9	10.8		21.8	12.9		21.8	18.3		17.3	13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.0		52.5	0.1		2.4	0.2		0.5	0.1	
Delay (s)	20.8	10.9		74.3	13.1		24.2	18.5		17.8	13.3	
Level of Service	C	B		E	B		C	B		B	B	
Approach Delay (s)		14.1			16.8			19.0			15.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	44.5	Sum of lost time (s)	13.7
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	303	348	133	306	349	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3526	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	378	145	333	379	10
RTOR Reduction (vph)	0	227	0	0	2	0
Lane Group Flow (vph)	329	151	145	333	387	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.5	20.5	11.7	48.2	32.3	
Effective Green, g (s)	20.5	20.5	11.7	48.2	32.3	
Actuated g/C Ratio	0.26	0.26	0.15	0.60	0.40	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	454	406	259	2132	1424	
v/s Ratio Prot	c0.19		c0.08	0.09	c0.11	
v/s Ratio Perm		0.10				
v/c Ratio	0.72	0.37	0.56	0.16	0.27	
Uniform Delay, d1	27.2	24.5	31.8	7.0	16.0	
Progression Factor	1.00	1.00	0.85	0.74	1.00	
Incremental Delay, d2	5.7	0.6	2.6	0.2	0.5	
Delay (s)	32.8	25.0	29.7	5.3	16.4	
Level of Service	C	C	C	A	B	
Approach Delay (s)	28.7			12.7	16.4	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	0	421	0	0	0	0	333	56	51	646	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	0	458	0	0	0	0	362	61	55	702	0
RTOR Reduction (vph)	0	0	301	0	0	0	0	0	25	0	0	0
Lane Group Flow (vph)	0	115	157	0	0	0	0	362	36	55	702	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		11.6	11.6					47.4	47.4	5.5	57.1	
Effective Green, g (s)		11.6	11.6					47.4	47.4	5.5	57.1	
Actuated g/C Ratio		0.14	0.14					0.59	0.59	0.07	0.71	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		257	404					2097	938	122	2526	
v/s Ratio Prot								0.10		c0.03	c0.20	
v/s Ratio Perm		0.06	0.06						0.02			
v/c Ratio		0.45	0.39					0.17	0.04	0.45	0.28	
Uniform Delay, d1		31.3	31.0					7.4	6.8	35.8	4.1	
Progression Factor		1.00	1.00					1.00	1.00	0.85	0.67	
Incremental Delay, d2		1.2	0.6					0.2	0.1	2.5	0.3	
Delay (s)		32.5	31.6					7.6	6.9	32.7	3.0	
Level of Service		C	C					A	A	C	A	
Approach Delay (s)		31.8			0.0			7.5			5.1	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	30	36	6	3	9	17	266	49	76	771	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.98		1.00	0.97	
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1720	1583	1770	1648		1770	3457		3433	3421	
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1720	1583	1770	1648		1770	3457		3433	3421	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	33	39	7	3	10	18	289	53	83	838	239
RTOR Reduction (vph)	0	0	34	0	10	0	0	20	0	0	33	0
Lane Group Flow (vph)	79	79	5	7	3	0	18	322	0	83	1044	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.4	6.4	6.4	1.0	1.0		0.5	22.1		2.5	24.1	
Effective Green, g (s)	6.4	6.4	6.4	1.0	1.0		0.5	22.1		2.5	24.1	
Actuated g/C Ratio	0.13	0.13	0.13	0.02	0.02		0.01	0.46		0.05	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	224	229	211	37	34		18	1592		179	1718	
v/s Ratio Prot	c0.05	0.05		c0.00	0.00		0.01	0.09		c0.02	c0.31	
v/s Ratio Perm			0.00									
v/c Ratio	0.35	0.34	0.02	0.19	0.09		1.00	0.20		0.46	0.61	
Uniform Delay, d1	18.9	18.9	18.1	23.1	23.1		23.8	7.7		22.1	8.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.9	0.0	2.5	1.2		212.1	0.1		1.9	0.6	
Delay (s)	19.9	19.8	18.1	25.6	24.3		235.9	7.8		24.0	9.2	
Level of Service	B	B	B	C	C		F	A		C	A	
Approach Delay (s)		19.5			24.7			19.2			10.2	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM Average Control Delay	13.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	37	19	15	31	63	35	273	25	98	761	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1843	1583		1833	1583	1770	3495		1770	3502	
Flt Permitted		0.91	1.00		0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1698	1583		1627	1583	1770	3495		1770	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	40	21	16	34	68	38	297	27	107	827	63
RTOR Reduction (vph)	0	0	19	0	0	60	0	7	0	0	5	0
Lane Group Flow (vph)	0	51	2	0	50	8	38	317	0	107	885	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		4.8	4.8		5.4	5.4	1.9	19.6		5.9	23.6	
Effective Green, g (s)		4.8	4.8		5.4	5.4	1.9	19.6		5.9	23.6	
Actuated g/C Ratio		0.11	0.11		0.12	0.12	0.04	0.43		0.13	0.52	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		179	167		193	188	74	1506		230	1816	
v/s Ratio Prot							0.02	0.09		c0.06	c0.25	
v/s Ratio Perm		0.03	0.00		c0.03	0.01						
v/c Ratio		0.28	0.01		0.26	0.04	0.51	0.21		0.47	0.49	
Uniform Delay, d1		18.8	18.2		18.2	17.8	21.3	8.1		18.3	7.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.0		0.3	0.0	2.5	0.1		0.5	0.3	
Delay (s)		19.1	18.2		18.5	17.8	23.8	8.2		18.9	7.4	
Level of Service		B	B		B	B	C	A		B	A	
Approach Delay (s)		18.8			18.1			9.9			8.6	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM Average Control Delay	10.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	21	2	0	0	41	356	5	6	694	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3532		1770	3489	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3532		1770	3489	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	23	2	0	0	45	387	5	7	754	78
RTOR Reduction (vph)	0	22	0	0	0	0	0	1	0	0	6	0
Lane Group Flow (vph)	24	1	0	0	2	0	45	391	0	7	826	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.9	1.9			0.8		1.5	21.2		0.5	20.2	
Effective Green, g (s)	1.9	1.9			0.8		1.5	21.2		0.5	20.2	
Actuated g/C Ratio	0.04	0.04			0.02		0.03	0.48		0.01	0.46	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	77	69			32		117	1706		20	1605	
v/s Ratio Prot	c0.01	0.00			c0.00		c0.01	0.11		0.00	c0.24	
v/s Ratio Perm												
v/c Ratio	0.31	0.01			0.06		0.38	0.23		0.35	0.51	
Uniform Delay, d1	20.4	20.1			21.2		20.7	6.6		21.5	8.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.0			0.3		0.8	0.2		3.8	0.7	
Delay (s)	21.2	20.1			21.5		21.5	6.8		25.4	9.1	
Level of Service	C	C			C		C	A		C	A	
Approach Delay (s)		20.7			21.5			8.3			9.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	43.9	Sum of lost time (s)	19.5
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	11	14	23	13	7	131	410	82	34	601	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1805	1583	3433	3451		1770	3486	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583		1863	1583	3433	3451		1770	3486	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	12	15	25	14	8	142	446	89	37	653	72
RTOR Reduction (vph)	0	0	14	0	0	8	0	14	0	0	8	0
Lane Group Flow (vph)	0	38	1	0	39	0	142	521	0	37	717	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		2.1	2.1		2.1	2.1	4.1	24.1		1.7	21.7	
Effective Green, g (s)		2.1	2.1		2.1	2.1	4.1	24.1		1.7	21.7	
Actuated g/C Ratio		0.05	0.05		0.05	0.05	0.10	0.57		0.04	0.51	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		92	78		92	78	331	1957		71	1780	
v/s Ratio Prot							c0.04	0.15		0.02	c0.21	
v/s Ratio Perm		0.02	0.00		c0.02	0.00						
v/c Ratio		0.41	0.01		0.42	0.01	0.43	0.27		0.52	0.40	
Uniform Delay, d1		19.6	19.2		19.6	19.2	18.1	4.7		20.0	6.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		1.1	0.0	0.3	0.2		3.2	0.4	
Delay (s)		20.7	19.2		20.8	19.2	18.4	4.9		23.2	6.8	
Level of Service		C	B		C	B	B	A		C	A	
Approach Delay (s)		20.3			20.5			7.7			7.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	14.6
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	17	359	47	0	1105
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	390	51	0	1201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.89					
vC, conflicting volume	991	195			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	754	195			441	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	309	813			1115	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	195	195	51	601	601
Volume Left	0	0	0	0	0	0
Volume Right	18	0	0	51	0	0
cSH	813	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.11	0.11	0.03	0.35	0.35
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		33.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	66	81	40	40	112	175	258	81	292	558	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1656		3433	3412		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1656		3433	3412		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	72	88	43	43	122	190	280	88	317	607	285
RTOR Reduction (vph)	0	0	58	0	107	0	0	27	0	0	0	155
Lane Group Flow (vph)	64	72	30	43	58	0	190	341	0	317	607	130
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	8.6	12.4	21.5	3.6	8.0		9.1	12.7		16.9	20.5	29.1
Effective Green, g (s)	8.6	12.4	21.5	3.6	8.0		9.1	12.7		16.9	20.5	29.1
Actuated g/C Ratio	0.14	0.19	0.34	0.06	0.13		0.14	0.20		0.27	0.32	0.46
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	463	363	534	100	208		490	680		470	1139	723
v/s Ratio Prot	0.02	c0.04	0.01	c0.02	c0.04		0.06	0.10		c0.18	c0.17	0.02
v/s Ratio Perm			0.01									0.06
v/c Ratio	0.14	0.20	0.06	0.43	0.28		0.39	0.50		0.67	0.53	0.18
Uniform Delay, d1	24.3	21.5	14.2	29.1	25.2		24.8	22.7		20.9	17.7	10.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.0	3.0	0.7		0.5	0.6		3.8	0.5	0.1
Delay (s)	24.4	21.8	14.3	32.0	26.0		25.3	23.3		24.7	18.2	10.4
Level of Service	C	C	B	C	C		C	C		C	B	B
Approach Delay (s)		19.6			27.2			24.0			18.0	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM Average Control Delay		20.6	HCM Level of Service	C
HCM Volume to Capacity ratio		0.46		
Actuated Cycle Length (s)		63.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization		52.8%	ICU Level of Service	A
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	3	79	9	0	5	261	572	40	12	463	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3505		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3505		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	3	86	10	0	5	284	622	43	13	503	113
RTOR Reduction (vph)	0	0	58	0	0	5	0	3	0	0	0	79
Lane Group Flow (vph)	30	3	28	0	10	0	284	662	0	13	503	34
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	1.9	1.9	16.9		0.8	0.8	15.0	29.1		0.5	14.6	14.6
Effective Green, g (s)	1.9	1.9	16.9		0.8	0.8	15.0	29.1		0.5	14.6	14.6
Actuated g/C Ratio	0.04	0.04	0.32		0.02	0.02	0.29	0.56		0.01	0.28	0.28
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	124	68	511		27	24	983	1946		17	986	441
v/s Ratio Prot	c0.01	0.00	0.02		c0.01		0.08	c0.19		0.01	c0.14	
v/s Ratio Perm			0.00			0.00						0.02
v/c Ratio	0.24	0.04	0.05		0.37	0.00	0.29	0.34		0.76	0.51	0.08
Uniform Delay, d1	24.5	24.4	12.2		25.6	25.4	14.6	6.4		25.9	15.9	13.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.3	0.0		8.4	0.1	0.2	0.1		106.9	0.4	0.1
Delay (s)	25.6	24.6	12.3		33.9	25.5	14.7	6.5		132.8	16.3	14.0
Level of Service	C	C	B		C	C	B	A		F	B	B
Approach Delay (s)		15.9			31.1			9.0			18.3	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM Average Control Delay	13.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	15.7	
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	179	245	392	584	838	520	95	277	66	96	271	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4616		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4616		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	266	426	635	911	565	103	301	72	104	295	104
RTOR Reduction (vph)	0	226	0	0	0	341	0	0	57	0	0	85
Lane Group Flow (vph)	195	466	0	635	911	224	103	301	15	104	295	19
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	16.4	15.9		22.9	22.6	26.7	5.7	16.2	16.2	4.1	14.7	14.7
Effective Green, g (s)	16.4	15.9		22.9	22.6	26.7	5.7	16.2	16.2	4.1	14.7	14.7
Actuated g/C Ratio	0.21	0.20		0.29	0.28	0.34	0.07	0.20	0.20	0.05	0.18	0.18
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	365	922		509	1444	935	246	720	322	177	654	292
v/s Ratio Prot	c0.11	0.10		c0.36	0.18	0.01	0.03	c0.09		0.03	c0.08	
v/s Ratio Perm						0.07			0.01			0.01
v/c Ratio	0.53	0.50		1.25	0.63	0.24	0.42	0.42	0.05	0.59	0.45	0.07
Uniform Delay, d1	28.2	28.3		28.3	24.9	19.1	35.4	27.6	25.5	36.9	28.9	26.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.4		127.0	0.9	0.1	1.2	0.4	0.1	4.9	0.5	0.1
Delay (s)	29.7	28.8		155.4	25.8	19.2	36.5	28.0	25.5	41.8	29.4	26.9
Level of Service	C	C		F	C	B	D	C	C	D	C	C
Approach Delay (s)		29.0			63.0			29.5			31.4	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	47.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	14.1	
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	254	31	348	1918	461	4	13	35	90	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5002		1770	6222			1842	1583	1770	1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.94	1.00	0.75	1.00	
Satd. Flow (perm)	1770	5002		1770	6222			1755	1583	1389	1651	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	276	34	378	2085	501	4	14	38	98	7	22
RTOR Reduction (vph)	0	14	0	0	25	0	0	0	34	0	20	0
Lane Group Flow (vph)	114	296	0	378	2561	0	0	18	4	98	9	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	9.8	10.5		51.9	53.6			9.8	9.8	9.8	9.8	
Effective Green, g (s)	9.8	10.5		51.9	53.6			9.8	9.8	9.8	9.8	
Actuated g/C Ratio	0.11	0.12		0.59	0.60			0.11	0.11	0.11	0.11	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	196	593		1037	3764			194	175	154	183	
v/s Ratio Prot	c0.06	0.06		0.21	c0.41						0.01	
v/s Ratio Perm								0.01	0.00	c0.07		
v/c Ratio	0.58	0.50		0.36	0.68			0.09	0.02	0.64	0.05	
Uniform Delay, d1	37.5	36.6		9.7	11.7			35.4	35.1	37.7	35.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.3	0.7		0.2	0.5			0.2	0.1	8.3	0.1	
Delay (s)	41.8	37.2		9.9	12.3			35.6	35.2	46.0	35.4	
Level of Service	D	D		A	B			D	D	D	D	
Approach Delay (s)		38.5			12.0			35.3			43.6	
Approach LOS		D			B			D			D	

Intersection Summary				
HCM Average Control Delay	16.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	15.4	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Proj Ph I (Year 2017) AM
1/3/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	88	227	92	29	11	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	247	100	32	12	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	132				554	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132				554	116
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				97	96
cM capacity (veh/h)	1454				461	937

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	96	247	132	48
Volume Left	96	0	0	12
Volume Right	0	0	32	36
cSH	1454	1700	1700	745
Volume to Capacity	0.07	0.15	0.08	0.06
Queue Length 95th (ft)	5	0	0	5
Control Delay (s)	7.7	0.0	0.0	10.2
Lane LOS	A			B
Approach Delay (s)	2.1		0.0	10.2
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	220	114	18	7	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	239	124	20	8	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	143				412	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	143				412	134
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1439				588	915

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	20	239	143	15
Volume Left	20	0	0	8
Volume Right	0	0	20	8
cSH	1439	1700	1700	716
Volume to Capacity	0.01	0.14	0.08	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	7.5	0.0	0.0	10.1
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	10.1
Approach LOS				B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1537	58	152	1041	95	40	9	496	218	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5022		1770	1514	1504	3433	3137	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5022		1770	1514	1504	3433	3137	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1671	63	165	1132	103	43	10	539	237	16	50
RTOR Reduction (vph)	0	0	17	0	5	0	0	246	4	0	45	0
Lane Group Flow (vph)	54	1671	46	165	1230	0	43	28	271	237	21	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.5	75.7	88.1	20.5	88.1		6.4	9.4	29.9	10.2	13.5	
Effective Green, g (s)	7.5	75.7	88.1	20.5	88.1		6.4	9.4	29.9	10.2	13.5	
Actuated g/C Ratio	0.06	0.56	0.65	0.15	0.65		0.05	0.07	0.22	0.08	0.10	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	98	2851	1033	521	3277		84	105	333	259	314	
v/s Ratio Prot	0.03	c0.33		0.05	0.24		0.02	0.02	c0.12	c0.07	c0.01	
v/s Ratio Perm			0.03						0.06			
v/c Ratio	0.55	0.59	0.04	0.32	0.38		0.51	0.27	0.81	0.92	0.07	
Uniform Delay, d1	62.1	19.4	8.4	51.0	10.8		62.8	59.5	49.9	62.0	55.0	
Progression Factor	1.00	1.00	1.00	0.87	0.71		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	0.9	0.0	0.1	0.1		2.2	0.5	13.4	33.5	0.0	
Delay (s)	65.9	20.3	8.4	44.5	7.7		65.0	60.1	63.3	95.4	55.1	
Level of Service	E	C	A	D	A		E	E	E	F	E	
Approach Delay (s)		21.2			12.0			61.9			86.6	
Approach LOS		C			B			E			F	

Intersection Summary				
HCM Average Control Delay	28.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	23.3	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1431	820	0	801	767	0	0	258	0	0	52
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1555	891	0	871	834	0	0	280	0	0	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked				0.79			0.79	0.79	0.79	0.79	0.79	
vC, conflicting volume	1704			2447			2047	3260	778	1929	3317	435
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1704			2297			1790	3330	177	1639	3403	435
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	57	100	100	90
cM capacity (veh/h)	369			170			36	6	658	30	6	569

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	778	778	891	435	435	834	280	28	28
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	891	0	0	834	280	28	28
cSH	1700	1700	1700	1700	1700	1700	658	569	569
Volume to Capacity	0.46	0.46	0.52	0.26	0.26	0.49	0.43	0.05	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	53	4	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.5	11.7	11.7
Lane LOS							B	B	B
Approach Delay (s)	0.0			0.0			14.5	11.7	
Approach LOS							B	B	

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	884	805	0	1353	551	215	0	293	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	961	875	0	1471	599	234	0	318	0	0	0
RTOR Reduction (vph)	0	0	170	0	0	117	0	0	281	0	0	0
Lane Group Flow (vph)	0	961	705	0	1471	482	117	117	37	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		108.7	108.7		108.7	108.7	15.5	15.5	15.5			
Effective Green, g (s)		108.7	108.7		108.7	108.7	15.5	15.5	15.5			
Actuated g/C Ratio		0.81	0.81		0.81	0.81	0.11	0.11	0.11			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		4094	1275		4094	1275	193	193	320			
v/s Ratio Prot		0.19			0.29		c0.07	0.07	0.01			
v/s Ratio Perm			c0.44			0.30						
v/c Ratio		0.23	0.55		0.36	0.38	0.61	0.61	0.11			
Uniform Delay, d1		3.2	4.6		3.6	3.7	56.8	56.8	53.6			
Progression Factor		0.73	4.20		0.32	2.35	1.00	1.00	1.00			
Incremental Delay, d2		0.1	1.5		0.2	0.8	5.3	5.3	0.2			
Delay (s)		2.4	20.9		1.4	9.4	62.1	62.1	53.8			
Level of Service		A	C		A	A	E	E	D			
Approach Delay (s)		11.2			3.7			57.3			0.0	
Approach LOS		B			A			E			A	

Intersection Summary				
HCM Average Control Delay	13.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	789	214	91	1550	6	103	62	103	33	71	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	858	233	99	1685	7	112	67	112	36	77	273
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	43	0	0	102
Lane Group Flow (vph)	188	858	233	99	1685	5	112	67	69	36	77	171
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	11.8	83.6	135.0	12.8	84.5	12.3	10.0	12.3	83.6	7.1	9.6	84.5
Effective Green, g (s)	11.8	83.6	135.0	12.8	84.5	12.3	10.0	12.3	83.6	7.1	9.6	84.5
Actuated g/C Ratio	0.09	0.62	1.00	0.09	0.63	0.09	0.07	0.09	0.62	0.05	0.07	0.63
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	3149	1583	168	3183	144	254	170	980	93	132	991
v/s Ratio Prot	c0.05	0.17		0.06	c0.33		c0.03	0.04		0.02	c0.04	
v/s Ratio Perm			c0.15			0.00			0.04			0.11
v/c Ratio	0.63	0.27	0.15	0.59	0.53	0.04	0.44	0.39	0.07	0.39	0.58	0.17
Uniform Delay, d1	59.5	11.8	0.0	58.6	14.1	55.9	59.8	57.8	10.2	61.8	60.8	10.6
Progression Factor	0.90	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.2	0.2	5.2	0.6	0.1	1.2	1.5	0.1	2.7	6.4	0.4
Delay (s)	57.5	7.6	0.2	63.8	14.8	56.0	61.0	59.3	10.4	64.5	67.2	11.0
Level of Service	E	A	A	E	B	E	E	E	B	E	E	B
Approach Delay (s)		13.6			17.6			41.2			27.2	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	19.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	725	28	41	901	28	88	3	28	58	3	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	5057		1770	5063			1777	1583		1778	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.67	1.00		0.55	1.00
Satd. Flow (perm)	1770	5057		1770	5063			1253	1583		1032	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	788	30	45	979	30	96	3	30	63	3	78
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	26	0	0	69
Lane Group Flow (vph)	105	816	0	45	1007	0	0	99	4	0	66	9
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	12.9	92.4		7.5	87.0			15.1	15.1		15.1	15.1
Effective Green, g (s)	12.9	92.4		7.5	87.0			15.1	15.1		15.1	15.1
Actuated g/C Ratio	0.10	0.73		0.06	0.69			0.12	0.12		0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	180	3679		105	3468			149	188		123	188
v/s Ratio Prot	c0.06	0.16		0.03	c0.20							
v/s Ratio Perm								c0.08	0.00		0.06	0.01
v/c Ratio	0.58	0.22		0.43	0.29			0.66	0.02		0.54	0.05
Uniform Delay, d1	54.5	5.6		57.7	7.9			53.5	49.4		52.7	49.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.8	0.1		2.8	0.2			10.6	0.0		4.4	0.1
Delay (s)	59.2	5.8		60.5	8.1			64.2	49.4		57.1	49.7
Level of Service	E	A		E	A			E	D		E	D
Approach Delay (s)		11.8			10.3			60.7			53.1	
Approach LOS		B			B			E			D	

Intersection Summary				
HCM Average Control Delay	16.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	815	46	151	763	23	165	28	101	53	20	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5045		3433	5085	1583	1770	3122		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5045		3433	5085	1583	1770	3122		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	886	50	164	829	25	179	30	110	58	22	134
RTOR Reduction (vph)	0	4	0	0	0	12	0	70	0	0	0	96
Lane Group Flow (vph)	63	932	0	164	829	13	179	70	0	58	22	38
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	5.3	46.7		11.7	53.0	53.0	19.8	49.7		8.2	38.1	38.1
Effective Green, g (s)	5.3	46.7		11.7	53.0	53.0	19.8	49.7		8.2	38.1	38.1
Actuated g/C Ratio	0.04	0.35		0.09	0.39	0.39	0.15	0.37		0.06	0.28	0.28
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	135	1745		298	1996	621	260	1149		108	526	447
v/s Ratio Prot	0.02	c0.18		c0.05	0.16		c0.10	0.02		c0.03	0.01	
v/s Ratio Perm						0.01						c0.02
v/c Ratio	0.47	0.53		0.55	0.42	0.02	0.69	0.06		0.54	0.04	0.08
Uniform Delay, d1	63.5	35.4		59.1	29.8	25.1	54.7	27.6		61.6	35.2	35.6
Progression Factor	1.00	1.00		0.94	0.47	0.29	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	1.2		2.0	0.6	0.1	7.4	0.0		5.1	0.1	0.4
Delay (s)	66.0	36.6		57.4	14.5	7.2	62.1	27.6		66.6	35.3	36.0
Level of Service	E	D		E	B	A	E	C		E	D	D
Approach Delay (s)		38.5			21.2			46.9			44.2	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	33.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.2	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	792	138	233	440	80	292	544	205	405	399	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4972		3433	4968		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4972		3433	4968		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	284	861	150	253	478	87	317	591	223	440	434	170
RTOR Reduction (vph)	0	18	0	0	19	0	0	0	155	0	0	104
Lane Group Flow (vph)	284	993	0	253	546	0	317	591	68	440	434	66
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	15.7	37.8		16.6	38.8		17.1	41.4	41.4	19.6	44.1	44.1
Effective Green, g (s)	15.7	37.8		16.6	38.8		17.1	41.4	41.4	19.6	44.1	44.1
Actuated g/C Ratio	0.12	0.28		0.12	0.29		0.13	0.31	0.31	0.15	0.33	0.33
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	399	1392		422	1428		435	1085	485	498	1156	517
v/s Ratio Prot	0.08	c0.20		c0.07	0.11		c0.09	c0.17		c0.13	0.12	
v/s Ratio Perm									0.04			0.04
v/c Ratio	0.71	0.71		0.60	0.38		0.73	0.54	0.14	0.88	0.38	0.13
Uniform Delay, d1	57.5	43.7		56.1	38.5		56.7	39.0	33.9	56.6	34.9	31.9
Progression Factor	0.61	0.59		0.92	0.87		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	3.0		2.3	0.8		6.0	2.0	0.6	16.8	0.9	0.5
Delay (s)	40.9	28.9		53.7	34.3		62.7	40.9	34.5	73.4	35.8	32.4
Level of Service	D	C		D	C		E	D	C	E	D	C
Approach Delay (s)		31.5			40.3			45.8			51.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1452	34	168	675	78	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1578	37	183	734	85	425
RTOR Reduction (vph)	0	7	0	0	0	26
Lane Group Flow (vph)	1578	30	183	734	85	399
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	96.0	107.8	13.2	113.7	11.8	25.0
Effective Green, g (s)	96.0	107.8	13.2	113.7	11.8	25.0
Actuated g/C Ratio	0.71	0.80	0.10	0.84	0.09	0.19
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3616	1264	336	4283	155	607
v/s Ratio Prot	c0.31	0.00	0.05	0.14	0.05	c0.06
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.44	0.02	0.54	0.17	0.55	0.66
Uniform Delay, d1	8.2	2.8	58.0	2.0	59.0	51.0
Progression Factor	0.20	0.00	1.06	0.84	1.00	1.00
Incremental Delay, d2	0.3	0.0	1.8	0.1	3.9	2.6
Delay (s)	1.9	0.0	63.5	1.7	63.0	53.6
Level of Service	A	A	E	A	E	D
Approach Delay (s)	1.9			14.1	55.2	
Approach LOS	A			B	E	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1454	83	194	699	116	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1580	90	211	760	126	460
RTOR Reduction (vph)	0	0	8	0	0	0	10
Lane Group Flow (vph)	0	1580	82	211	760	126	450
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		84.0	84.0	20.6	109.6	15.0	35.6
Effective Green, g (s)		84.0	84.0	20.6	109.6	15.0	35.6
Actuated g/C Ratio		0.62	0.62	0.15	0.81	0.11	0.26
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2202	985	270	4128	197	469
v/s Ratio Prot		c0.45		0.12	0.15	0.07	c0.15
v/s Ratio Perm			0.05				0.14
v/c Ratio		0.72	0.08	0.78	0.18	0.64	0.96
Uniform Delay, d1		17.4	10.2	55.0	2.8	57.4	49.0
Progression Factor		0.29	0.24	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.8	0.1	13.7	0.1	6.7	31.5
Delay (s)		6.9	2.6	68.7	2.9	64.1	80.5
Level of Service		A	A	E	A	E	F
Approach Delay (s)		6.6			17.2	77.0	
Approach LOS		A			B	E	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.1
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1231	646	207	658	0	0	0	0	777	7	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1606	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1606	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1338	702	225	715	0	0	0	0	845	8	255
RTOR Reduction (vph)	0	0	386	0	0	0	0	0	0	0	3	107
Lane Group Flow (vph)	0	1338	316	225	715	0	0	0	0	439	437	122
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		36.0	36.0	7.2	47.2					24.8	24.8	24.8
Effective Green, g (s)		36.0	36.0	7.2	47.2					24.8	24.8	24.8
Actuated g/C Ratio		0.45	0.45	0.09	0.59					0.31	0.31	0.31
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1593	1254	309	2088					521	498	466
v/s Ratio Prot		c0.38		c0.07	0.20					0.26	c0.27	
v/s Ratio Perm			0.11									0.08
v/c Ratio		0.84	0.25	0.73	0.34					0.84	0.88	0.26
Uniform Delay, d1		19.5	13.6	35.4	8.4					25.8	26.2	20.7
Progression Factor		1.00	1.00	0.93	0.65					1.00	1.00	1.00
Incremental Delay, d2		4.1	0.1	7.5	0.4					11.8	16.0	0.3
Delay (s)		23.5	13.8	40.2	5.8					37.6	42.1	21.0
Level of Service		C	B	D	A					D	D	C
Approach Delay (s)		20.2			14.1			0.0			36.0	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Proj Ph I (Year 2017) PM
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	558	1450	0	0	518	86	347	0	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3464		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3464		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	607	1576	0	0	563	93	377	0	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	37	0	0	0
Lane Group Flow (vph)	607	1576	0	0	641	0	377	0	156	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	19.0	56.2			33.0		13.8		13.8			
Effective Green, g (s)	19.0	56.2			33.0		13.8		13.8			
Actuated g/C Ratio	0.24	0.70			0.41		0.17		0.17			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	815	2486			1429		592		273			
v/s Ratio Prot	c0.18	c0.45			0.19		c0.11					
v/s Ratio Perm									0.10			
v/c Ratio	0.74	0.63			0.45		0.64		0.57			
Uniform Delay, d1	28.3	6.4			16.9		30.8		30.4			
Progression Factor	0.83	0.48			1.00		1.00		1.00			
Incremental Delay, d2	2.0	0.7			1.0		2.3		2.9			
Delay (s)	25.3	3.7			18.0		33.0		33.2			
Level of Service	C	A			B		C		C			
Approach Delay (s)		9.7			18.0			33.1			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Proj Ph I (Year 2017) PM
12: Lightwave Avenue & Overland Avenue

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	71	0	6	120	174	46	122	18	204	31	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00		1.00	0.91		1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539		1770	3225		1770	3470		1770	3295	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539		1770	3225		1770	3470		1770	3295	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	77	0	7	130	189	50	133	20	222	34	29
RTOR Reduction (vph)	0	0	0	0	153	0	0	14	0	0	20	0
Lane Group Flow (vph)	67	77	0	7	166	0	50	139	0	222	43	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.9	13.8		0.6	10.5		4.9	7.8		13.7	16.6	
Effective Green, g (s)	3.9	13.8		0.6	10.5		4.9	7.8		13.7	16.6	
Actuated g/C Ratio	0.07	0.25		0.01	0.19		0.09	0.14		0.25	0.30	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	127	896		19	621		159	497		445	1004	
v/s Ratio Prot	c0.04	c0.02		0.00	c0.05		0.03	c0.04		c0.13	0.01	
v/s Ratio Perm												
v/c Ratio	0.53	0.09		0.37	0.27		0.31	0.28		0.50	0.04	
Uniform Delay, d1	24.4	15.5		26.8	18.7		23.2	20.8		17.5	13.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.0		4.4	0.3		0.4	0.3		0.3	0.0	
Delay (s)	26.2	15.6		31.1	19.0		23.6	21.2		17.8	13.4	
Level of Service	C	B		C	B		C	C		B	B	
Approach Delay (s)		20.5			19.2			21.8			16.8	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	23.5
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	66	468	956	726	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3526	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	72	509	1039	789	20
RTOR Reduction (vph)	0	65	0	0	2	0
Lane Group Flow (vph)	88	7	509	1039	807	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	8.1	8.1	27.6	60.6	28.8	
Effective Green, g (s)	8.1	8.1	27.6	60.6	28.8	
Actuated g/C Ratio	0.10	0.10	0.35	0.76	0.36	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	179	160	611	2681	1269	
v/s Ratio Prot	c0.05		c0.29	0.29	c0.23	
v/s Ratio Perm		0.00				
v/c Ratio	0.49	0.05	0.83	0.39	0.64	
Uniform Delay, d1	34.0	32.5	24.1	3.3	21.2	
Progression Factor	1.00	1.00	0.94	0.02	1.00	
Incremental Delay, d2	2.1	0.1	1.0	0.0	2.4	
Delay (s)	36.1	32.6	23.7	0.1	23.7	
Level of Service	D	C	C	A	C	
Approach Delay (s)	34.5			7.9	23.7	
Approach LOS	C			A	C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	5	183	0	0	0	0	1268	394	415	377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1776	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1776	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	5	199	0	0	0	0	1378	428	451	410	0
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	272	0	0	0
Lane Group Flow (vph)	0	175	32	0	0	0	0	1378	156	451	410	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		12.8	12.8					29.2	29.2	22.5	55.9	
Effective Green, g (s)		12.8	12.8					29.2	29.2	22.5	55.9	
Actuated g/C Ratio		0.16	0.16					0.36	0.36	0.28	0.70	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		284	446					1292	578	498	2473	
v/s Ratio Prot								c0.39		c0.25	0.12	
v/s Ratio Perm		0.10	0.01						0.10			
v/c Ratio		0.62	0.07					1.07	0.27	0.91	0.17	
Uniform Delay, d1		31.3	28.6					25.4	17.9	27.7	4.1	
Progression Factor		1.00	1.00					1.00	1.00	0.61	0.17	
Incremental Delay, d2		3.9	0.1					44.9	1.1	17.0	0.1	
Delay (s)		35.3	28.6					70.3	19.0	34.1	0.8	
Level of Service		D	C					E	B	C	A	
Approach Delay (s)		31.7			0.0			58.1			18.2	
Approach LOS		C			A			E			B	

Intersection Summary			
HCM Average Control Delay	43.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	4	17	43	32	82	18	1239	4	14	464	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1687	1583	1770	1662		1770	3538		3433	3460	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1687	1583	1770	1662		1770	3538		3433	3460	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	371	4	18	47	35	89	20	1347	4	15	504	89
RTOR Reduction (vph)	0	0	15	0	83	0	0	0	0	0	17	0
Lane Group Flow (vph)	189	186	3	47	41	0	20	1351	0	15	576	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.6	12.6	12.6	4.4	4.4		0.6	32.1		0.6	32.1	
Effective Green, g (s)	12.6	12.6	12.6	4.4	4.4		0.6	32.1		0.6	32.1	
Actuated g/C Ratio	0.19	0.19	0.19	0.07	0.07		0.01	0.49		0.01	0.49	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	324	304	119	111		16	1729		31	1691	
v/s Ratio Prot	c0.11	0.11		c0.03	0.02		c0.01	c0.38		0.00	0.17	
v/s Ratio Perm			0.00									
v/c Ratio	0.59	0.57	0.01	0.39	0.37		1.25	0.78		0.48	0.34	
Uniform Delay, d1	24.2	24.1	21.5	29.4	29.3		32.6	13.9		32.4	10.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	2.5	0.0	2.2	2.1		314.0	2.4		11.4	0.1	
Delay (s)	26.9	26.6	21.5	31.5	31.4		346.6	16.3		43.8	10.4	
Level of Service	C	C	C	C	C		F	B		D	B	
Approach Delay (s)		26.5			31.4			21.1			11.3	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	14	70	92	52	167	28	925	20	37	496	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794	1583		1805	1583	1770	3528		1770	3516	
Flt Permitted		0.68	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1259	1583		1431	1583	1770	3528		1770	3516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	15	76	100	57	182	30	1005	22	40	539	25
RTOR Reduction (vph)	0	0	61	0	0	133	0	2	0	0	3	0
Lane Group Flow (vph)	0	65	15	0	157	49	30	1025	0	40	561	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.5	10.5		11.1	11.1	1.8	26.7		1.4	26.3	
Effective Green, g (s)		10.5	10.5		11.1	11.1	1.8	26.7		1.4	26.3	
Actuated g/C Ratio		0.20	0.20		0.21	0.21	0.03	0.50		0.03	0.49	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		246	309		295	327	59	1751		46	1719	
v/s Ratio Prot							0.02	c0.29		c0.02	0.16	
v/s Ratio Perm		0.05	0.01		c0.11	0.03						
v/c Ratio		0.26	0.05		0.53	0.15	0.51	0.59		0.87	0.33	
Uniform Delay, d1		18.4	17.6		19.0	17.5	25.6	9.6		26.1	8.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		0.9	0.1	2.5	0.7		81.6	0.2	
Delay (s)		18.6	17.6		20.0	17.6	28.1	10.3		107.7	8.5	
Level of Service		B	B		B	B	C	B		F	A	
Approach Delay (s)		18.1			18.7			10.8			15.1	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	13.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	0	36	8	0	9	13	865	2	1	717	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1690		3433	3538		1770	3533	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1690		3433	3538		1770	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	39	9	0	10	14	940	2	1	779	9
RTOR Reduction (vph)	0	35	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	83	4	0	0	9	0	14	942	0	1	787	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Effective Green, g (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Actuated g/C Ratio	0.11	0.11			0.02		0.01	0.47		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	202	181			30		34	1678		17	1676	
v/s Ratio Prot	c0.05	0.00			c0.01		c0.00	c0.27		0.00	0.22	
v/s Ratio Perm												
v/c Ratio	0.41	0.02			0.31		0.41	0.56		0.06	0.47	
Uniform Delay, d1	20.9	20.0			24.6		25.0	9.6		24.9	9.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			2.1		2.9	0.8		0.5	0.5	
Delay (s)	21.4	20.0			26.7		27.9	10.4		25.4	9.6	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		21.0			26.7			10.7			9.6	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	19.5
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	6	78	151	30	66	38	638	23	4	702	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779	1583		1788	1583	3433	3521		1770	3517	
Flt Permitted		0.60	1.00		0.68	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1125	1583		1259	1583	3433	3521		1770	3517	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	7	85	164	33	72	41	693	25	4	763	33
RTOR Reduction (vph)	0	0	68	0	0	57	0	3	0	0	3	0
Lane Group Flow (vph)	0	128	17	0	197	15	41	715	0	4	793	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.0	10.0		10.0	10.0	1.2	24.4		0.6	23.8	
Effective Green, g (s)		10.0	10.0		10.0	10.0	1.2	24.4		0.6	23.8	
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.02	0.49		0.01	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		227	319		254	319	83	1732		21	1688	
v/s Ratio Prot							c0.01	0.20		0.00	c0.23	
v/s Ratio Perm		0.11	0.01		c0.16	0.01						
v/c Ratio		0.56	0.05		0.78	0.05	0.49	0.41		0.19	0.47	
Uniform Delay, d1		17.8	16.0		18.7	16.0	23.9	8.0		24.3	8.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.9	0.0		12.6	0.0	1.7	0.4		1.6	0.5	
Delay (s)		19.7	16.0		31.4	16.0	25.6	8.5		25.9	9.2	
Level of Service		B	B		C	B	C	A		C	A	
Approach Delay (s)		18.3			27.2			9.4			9.3	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	49.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	57	984	24	0	890
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	62	1070	26	0	967
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.87	0.83			0.83	
vC, conflicting volume	1553	535			1096	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	889	27			703	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			100	
cM capacity (veh/h)	247	864			738	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	535	535	26	484	484
Volume Left	0	0	0	0	0	0
Volume Right	62	0	0	26	0	0
cSH	864	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.31	0.31	0.02	0.28	0.28
Queue Length 95th (ft)	6	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	37.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	25	132	79	73	233	164	665	41	135	602	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1650		3433	3508		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1650		3433	3508		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	27	143	86	79	253	178	723	45	147	654	172
RTOR Reduction (vph)	0	0	113	0	123	0	0	4	0	0	0	89
Lane Group Flow (vph)	168	27	30	86	209	0	178	764	0	147	654	83
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	12.2	7.8	17.0	19.3	15.5		9.2	24.1		12.0	26.9	39.1
Effective Green, g (s)	12.2	7.8	17.0	19.3	15.5		9.2	24.1		12.0	26.9	39.1
Actuated g/C Ratio	0.15	0.10	0.21	0.24	0.19		0.11	0.30		0.15	0.33	0.48
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	515	179	331	420	315		388	1040		261	1171	761
v/s Ratio Prot	c0.05	0.01	0.01	0.05	c0.13		0.05	c0.22		c0.08	c0.18	0.02
v/s Ratio Perm			0.01									0.04
v/c Ratio	0.33	0.15	0.09	0.20	0.66		0.46	0.73		0.56	0.56	0.11
Uniform Delay, d1	30.9	33.7	25.9	24.8	30.5		33.7	25.7		32.2	22.3	11.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.1	0.2	5.2		0.9	2.7		2.8	0.6	0.1
Delay (s)	31.2	34.1	26.0	25.1	35.7		34.6	28.4		35.0	22.9	11.6
Level of Service	C	C	C	C	D		C	C		C	C	B
Approach Delay (s)		29.3			33.5			29.6			22.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.7	HCM Level of Service		C
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	81.3	Sum of lost time (s)		23.0
Intersection Capacity Utilization	64.4%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	0	285	16	4	16	103	622	4	15	767	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Flt Permitted	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	310	17	4	17	112	676	4	16	834	30
RTOR Reduction (vph)	0	0	220	0	0	16	0	0	0	0	0	13
Lane Group Flow (vph)	87	0	90	0	21	1	112	680	0	16	834	17
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	5.5		18.4		3.4	3.4	12.9	33.9		0.6	21.6	21.6
Effective Green, g (s)	5.5		18.4		3.4	3.4	12.9	33.9		0.6	21.6	21.6
Actuated g/C Ratio	0.09		0.29		0.05	0.05	0.20	0.53		0.01	0.34	0.34
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	297		459		96	85	697	1888		17	1204	538
v/s Ratio Prot	c0.03		0.04		c0.01		0.03	c0.19		0.01	c0.24	
v/s Ratio Perm			0.02			0.00						0.01
v/c Ratio	0.29		0.20		0.22	0.01	0.16	0.36		0.94	0.69	0.03
Uniform Delay, d1	27.2		17.0		28.8	28.5	20.8	8.5		31.4	18.1	14.0
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6		0.2		1.2	0.1	0.1	0.1		188.5	1.7	0.0
Delay (s)	27.7		17.2		29.9	28.5	20.9	8.7		220.0	19.8	14.0
Level of Service	C		B		C	C	C	A		F	B	B
Approach Delay (s)		19.5			29.3			10.4			23.3	
Approach LOS		B			C			B			C	

Intersection Summary				
HCM Average Control Delay	17.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	15.7	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex + Proj Ph I (Year 2017) PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	867	141	109	479	227	417	437	351	489	434	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	942	153	118	521	247	453	475	382	532	472	232
RTOR Reduction (vph)	0	18	0	0	0	133	0	0	155	0	0	182
Lane Group Flow (vph)	158	1077	0	118	521	114	453	475	227	532	472	50
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	9.8	29.2		10.6	30.2	46.1	18.4	24.0	24.0	15.9	21.6	21.6
Effective Green, g (s)	9.8	29.2		10.6	30.2	46.1	18.4	24.0	24.0	15.9	21.6	21.6
Actuated g/C Ratio	0.10	0.29		0.11	0.30	0.46	0.18	0.24	0.24	0.16	0.22	0.22
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	173	1451		187	1533	1282	630	848	379	545	763	341
v/s Ratio Prot	c0.09	c0.22		c0.07	0.10	0.01	0.13	0.13		c0.15	0.13	
v/s Ratio Perm						0.03			c0.14			0.03
v/c Ratio	0.91	0.74		0.63	0.34	0.09	0.72	0.56	0.60	0.98	0.62	0.15
Uniform Delay, d1	44.8	32.1		42.9	27.2	15.2	38.5	33.5	33.8	42.0	35.6	31.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.1	2.1		6.8	0.1	0.0	3.9	0.9	2.5	32.2	1.5	0.2
Delay (s)	88.8	34.2		49.7	27.4	15.3	42.4	34.3	36.4	74.1	37.1	32.0
Level of Service	F	C		D	C	B	D	C	D	E	D	C
Approach Delay (s)		41.1			27.0			37.7			52.1	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	40.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	100.2	Sum of lost time (s)	13.2	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1738	21	47	691	74	24	7	484	448	13	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5076		1770	6315			1794	1583	1770	1615	
Flt Permitted	0.95	1.00		0.95	1.00			0.81	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5076		1770	6315			1500	1583	1369	1615	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	1889	23	51	751	80	26	8	526	487	14	109
RTOR Reduction (vph)	0	1	0	0	15	0	0	0	73	0	67	0
Lane Group Flow (vph)	48	1911	0	51	816	0	0	34	453	487	56	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	6.4	49.1		4.2	47.9			44.4	44.4	44.4	44.4	
Effective Green, g (s)	6.4	49.1		4.2	47.9			44.4	44.4	44.4	44.4	
Actuated g/C Ratio	0.06	0.43		0.04	0.42			0.39	0.39	0.39	0.39	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	99	2184		65	2651			584	616	533	628	
v/s Ratio Prot	0.03	c0.38		c0.03	0.13						0.03	
v/s Ratio Perm								0.02	0.29	c0.36		
v/c Ratio	0.48	0.87		0.78	0.31			0.06	0.74	0.91	0.09	
Uniform Delay, d1	52.3	29.7		54.5	22.1			21.8	29.8	33.0	22.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	4.2		44.9	0.1			0.0	4.6	20.2	0.1	
Delay (s)	56.0	33.9		99.4	22.1			21.8	34.4	53.2	22.1	
Level of Service	E	C		F	C			C	C	D	C	
Approach Delay (s)		34.5			26.6			33.6			46.9	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM Average Control Delay	34.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	102.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	46	116	210	15	36	107
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	126	228	16	39	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	245				462	236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	245				462	236
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				93	86
cM capacity (veh/h)	1322				536	803

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	50	126	245	155
Volume Left	50	0	0	39
Volume Right	0	0	16	116
cSH	1322	1700	1700	1073
Volume to Capacity	0.04	0.07	0.14	0.14
Queue Length 95th (ft)	3	0	0	13
Control Delay (s)	7.8	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	2.2		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	143	204	9	21	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	155	222	10	23	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	232				402	227
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	232				402	227
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	1336				600	813

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	10	155	232	46
Volume Left	10	0	0	23
Volume Right	0	0	10	23
cSH	1336	1700	1700	690
Volume to Capacity	0.01	0.09	0.14	0.07
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	7.7	0.0	0.0	10.6
Lane LOS	A			B
Approach Delay (s)	0.5		0.0	10.6
Approach LOS				B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

ILV ANALYSIS WORKSHEETS

LINSCOTT LAW & GREENSPAN engineers

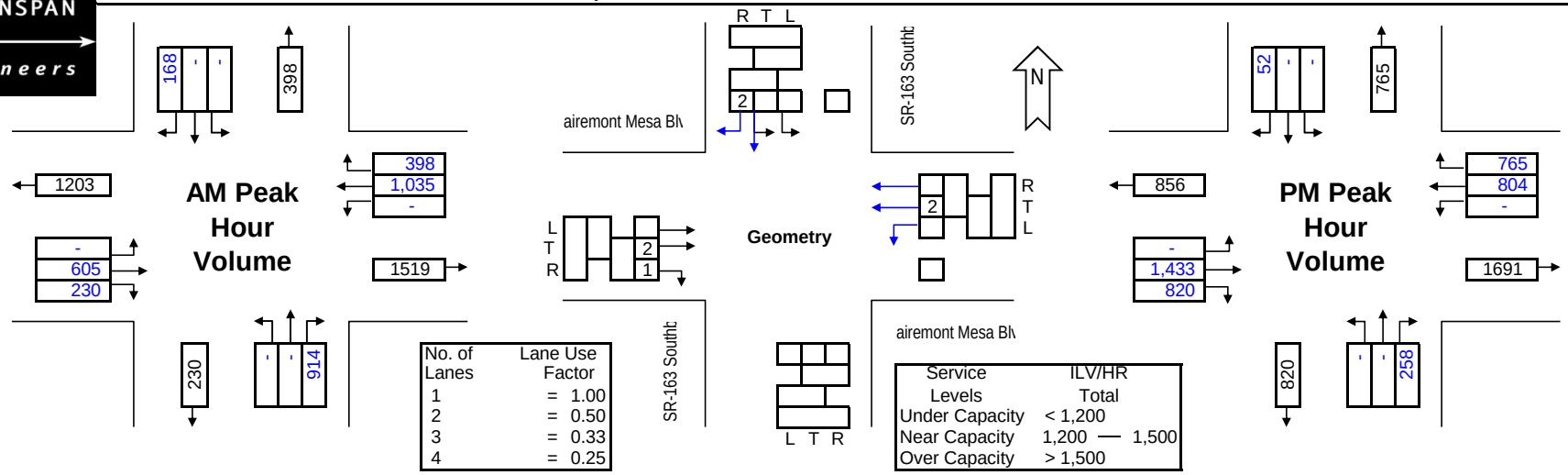
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



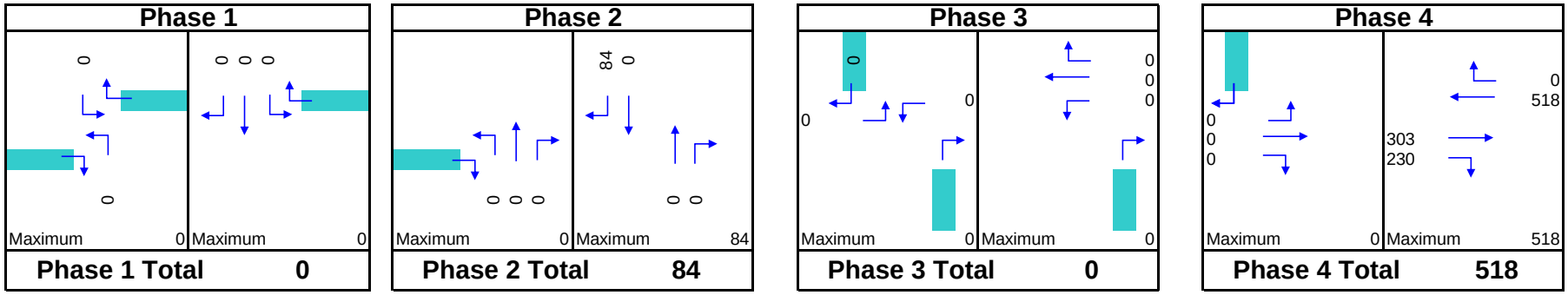
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 602

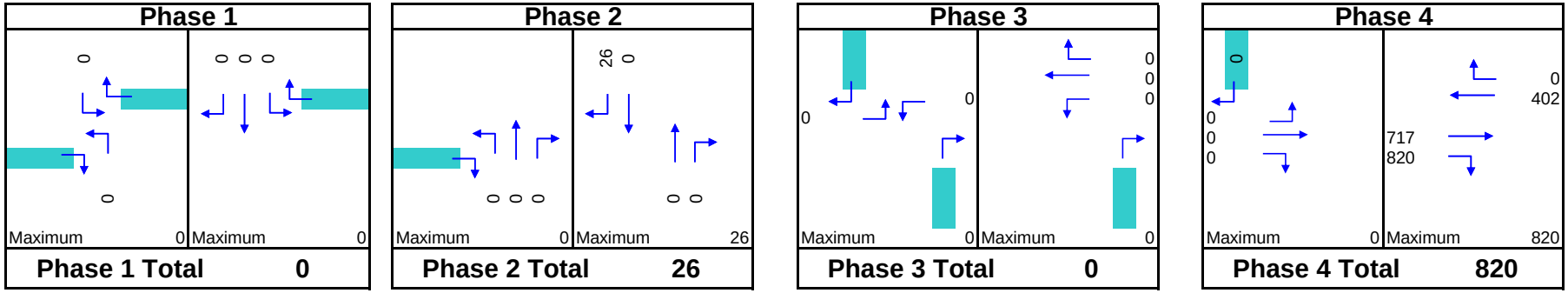
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 846

Service Level: **Under Capacity**



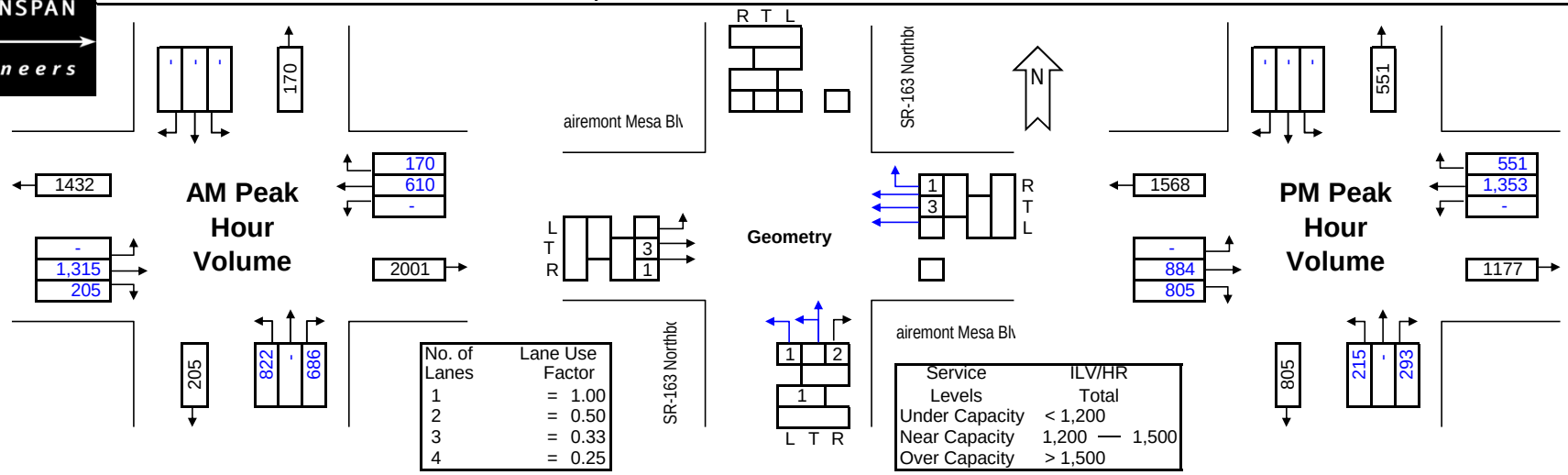
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



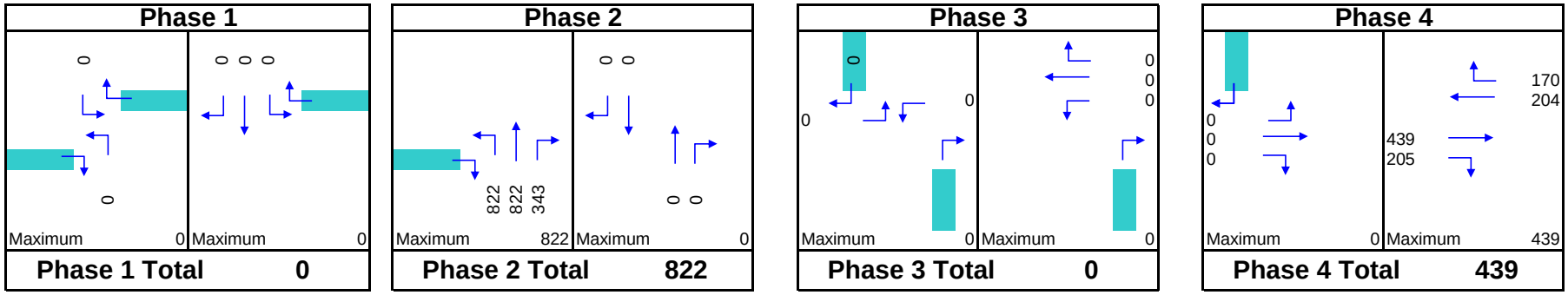
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1261

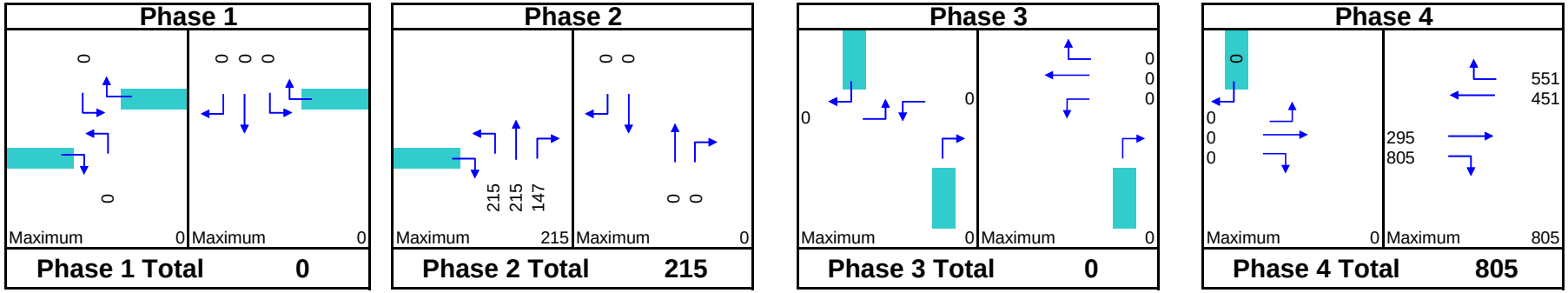
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1020

Service Level: **Under Capacity**



LINSCOTT LAW & GREENSPAN engineers

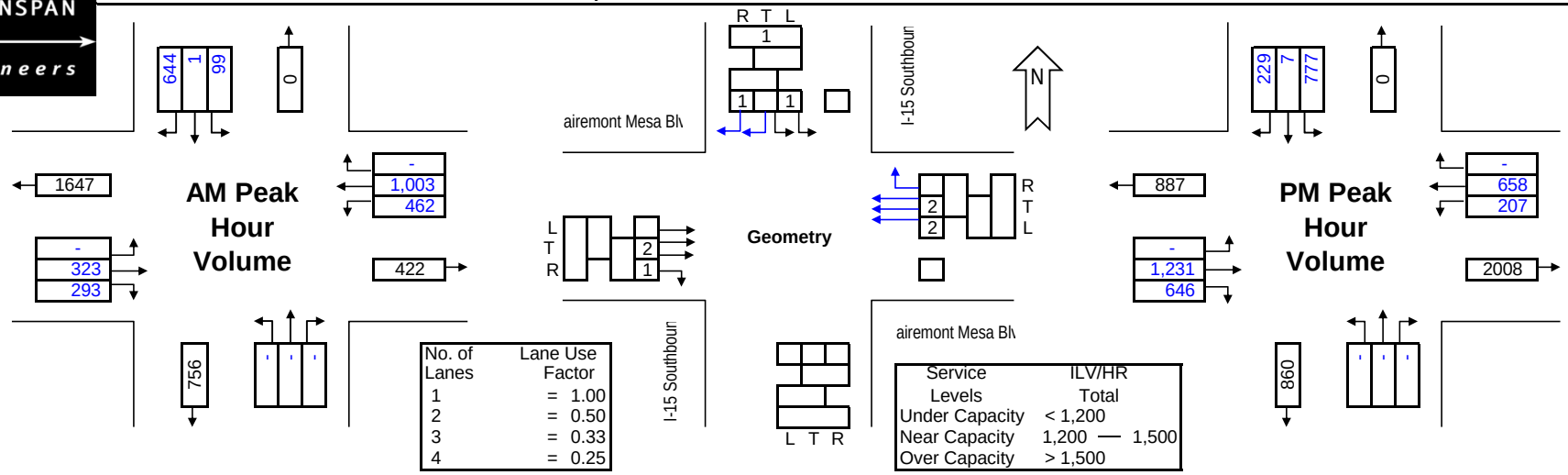
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



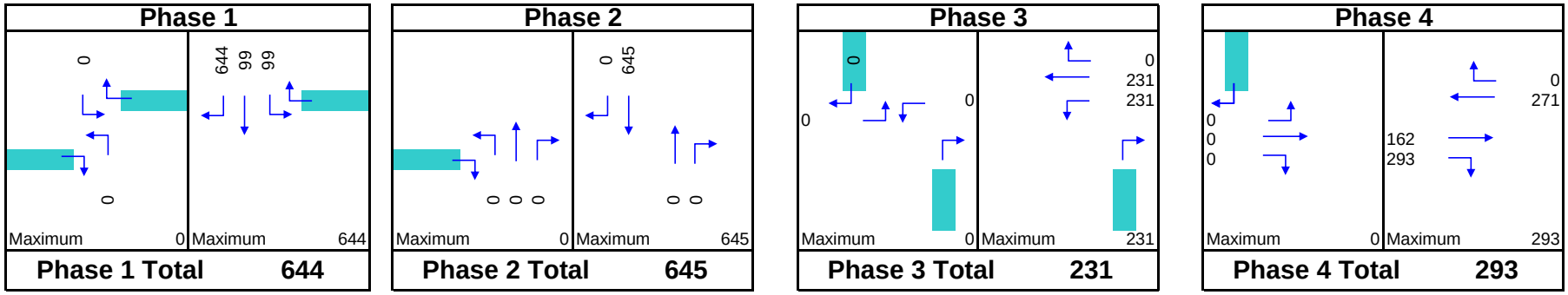
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1813

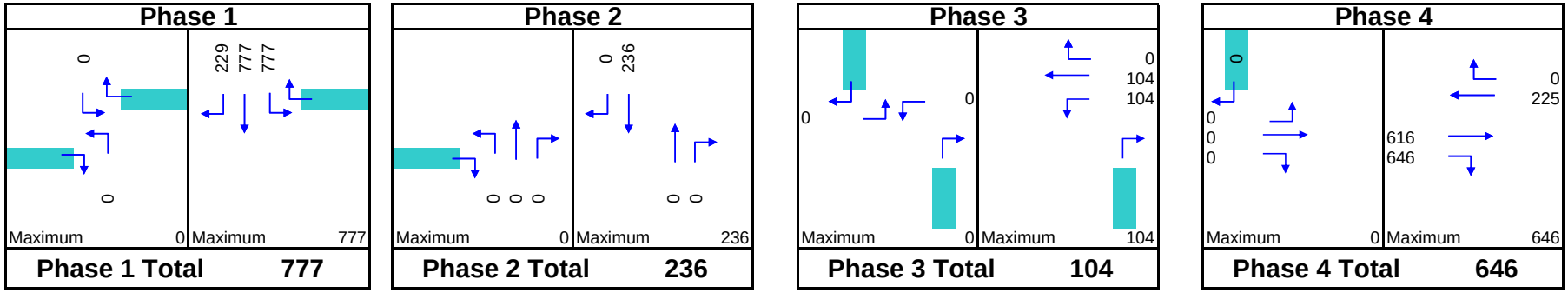
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1763

Service Level: **Over Capacity**



LINSCOTT LAW & GREENSPAN engineers

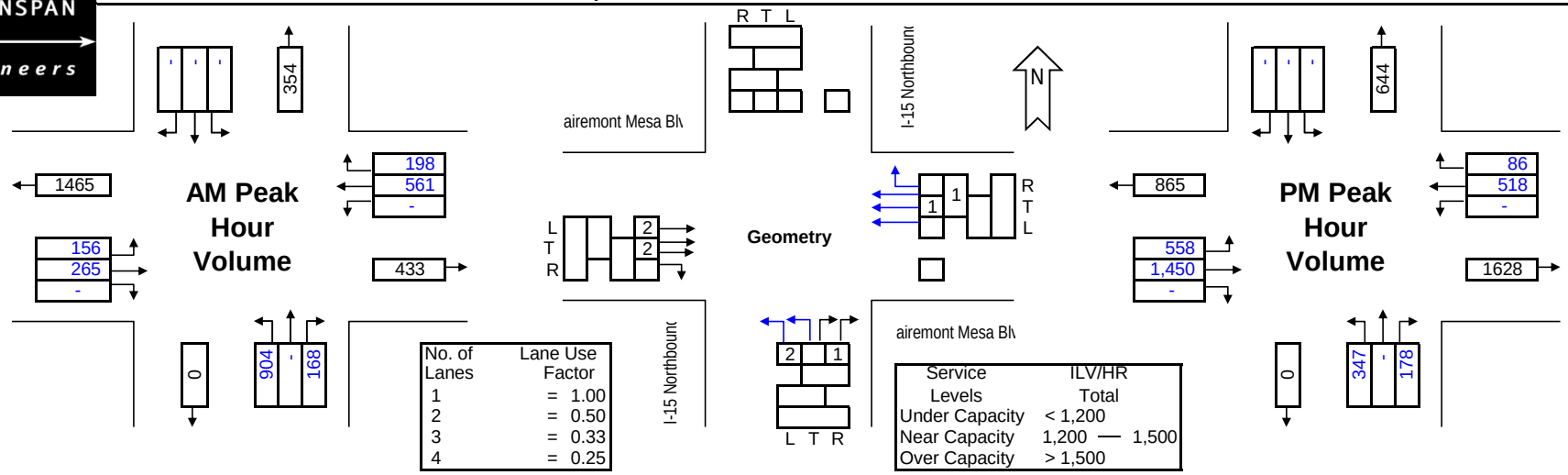
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



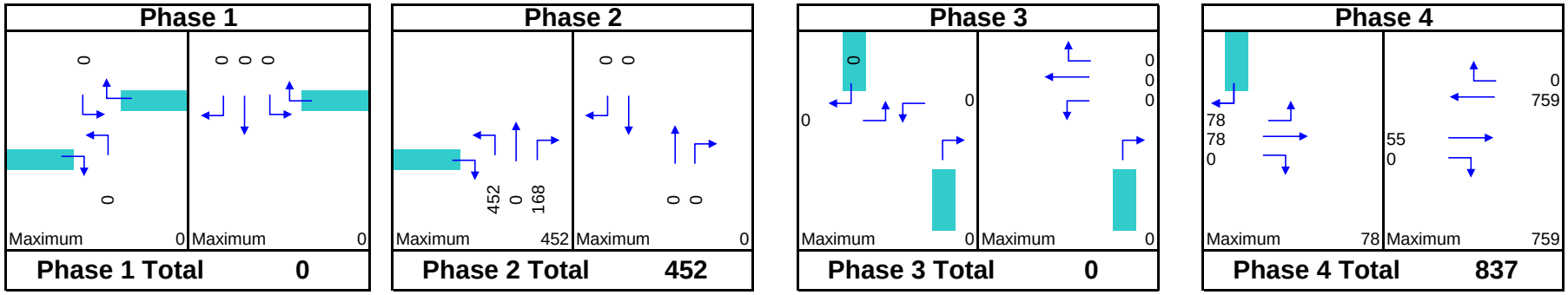
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1289

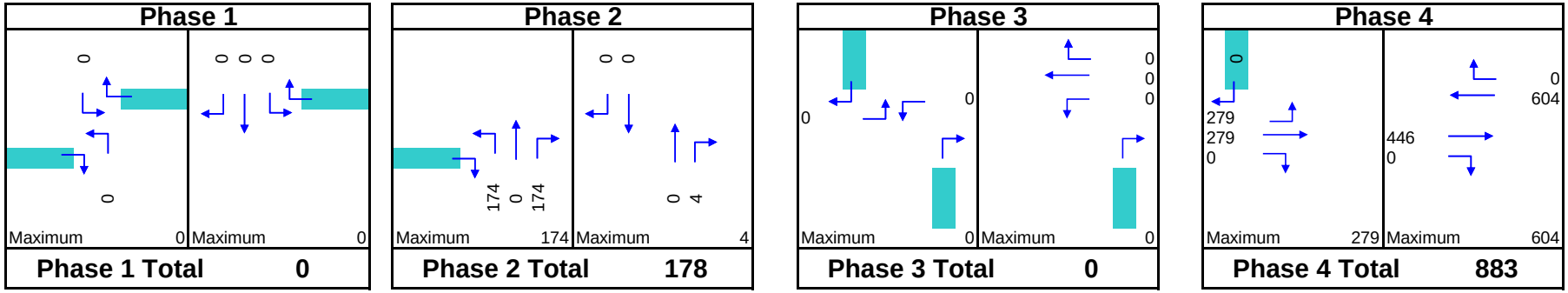
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1061

Service Level: **Under Capacity**



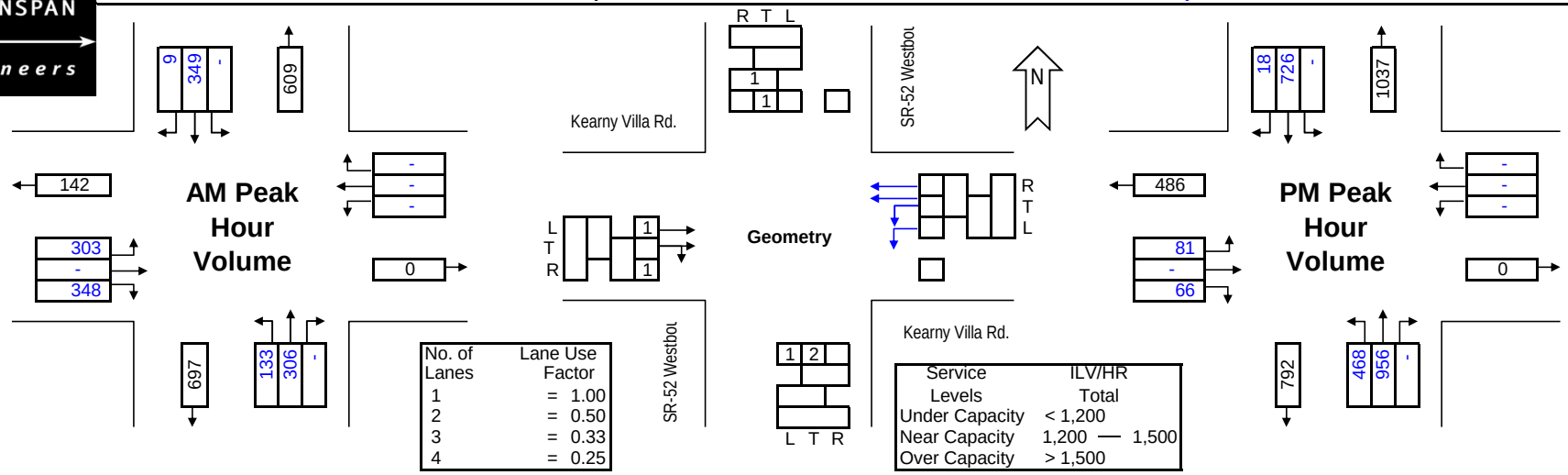
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps N/S
at Kearny Villa Rd. E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 839

Service Level: **Under Capacity**

Phase 1

0 0 0 0 0 0

Maximum 0 Maximum 0

Phase 1 Total 0

Phase 2

0 358 133 133 0 20 0

Maximum 133 Maximum 358

Phase 2 Total 491

Phase 3

0 0 0 0 0 0 0

Maximum 0 Maximum 0

Phase 3 Total 0

Phase 4

303 0 303 0 45 0 0

Maximum 303 Maximum 45

Phase 4 Total 348

PM Peak Hour Analysis

Total Crictical Lane Volume 1293

Service Level: **Near Capacity**

Phase 1

0 0 0 0 0 0

Maximum 0 Maximum 0

Phase 1 Total 0

Phase 2

0 744 468 468 0 10 0

Maximum 468 Maximum 744

Phase 2 Total 1212

Phase 3

0 0 0 0 0 0 0

Maximum 0 Maximum 0

Phase 3 Total 0

Phase 4

81 0 66 0 0 0 0

Maximum 81 Maximum 0

Phase 4 Total 81

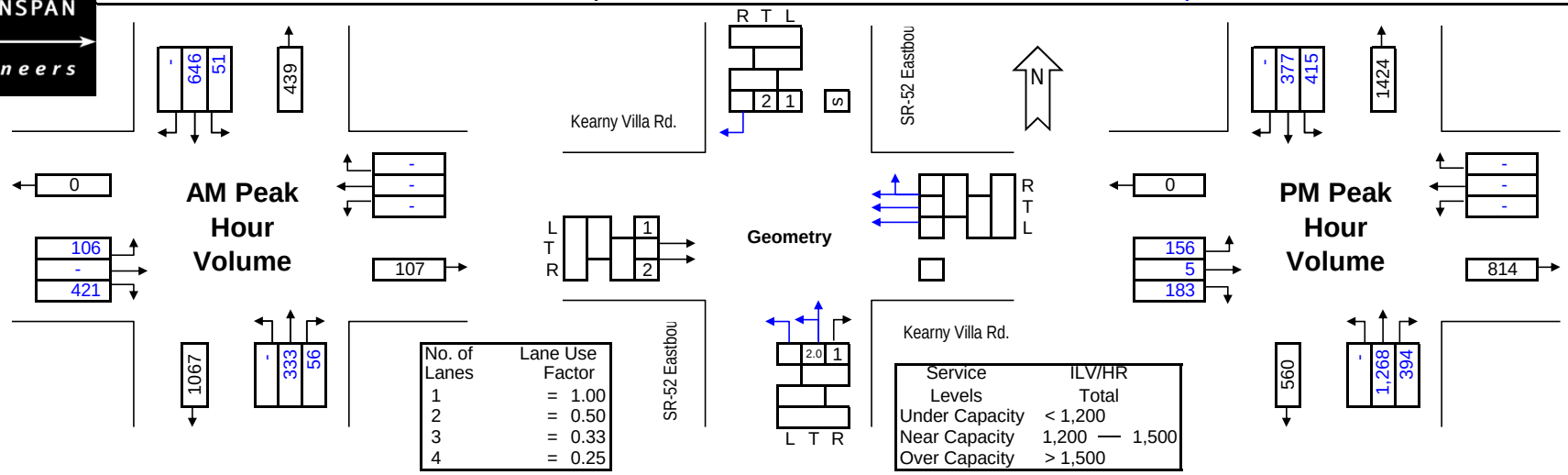
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps at Kearny Villa Rd.
N/S
E/W



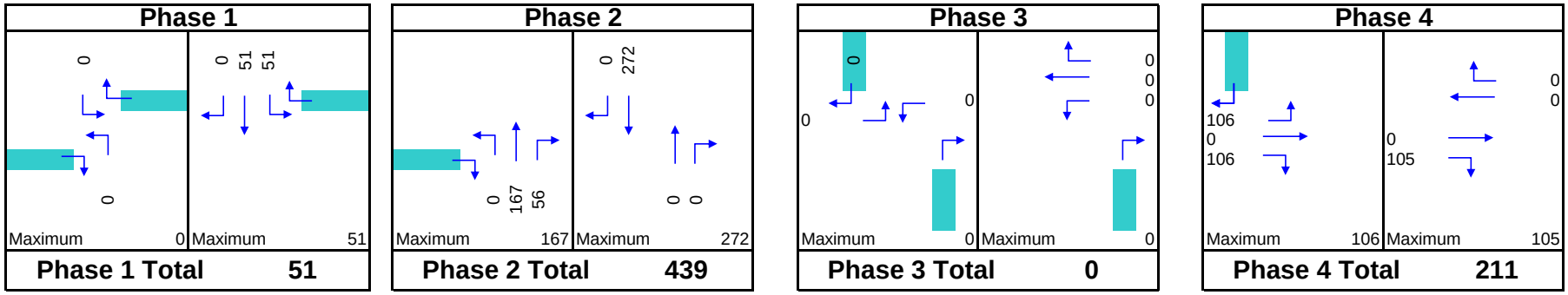
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 701

Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1205

Service Level: **Near Capacity**

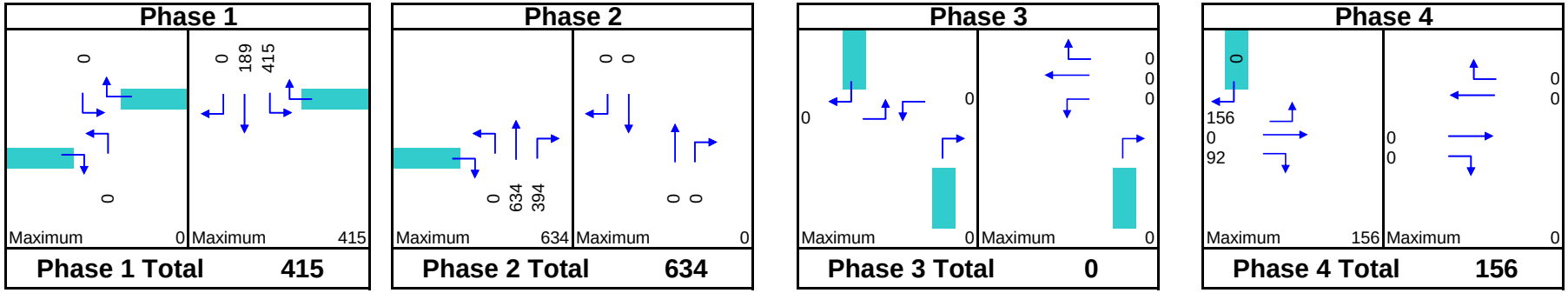


Table X
Existing + Project PH I ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	602	Under Capacity
	PM	846	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,261	Near Capacity
	PM	1,020	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	1,813	Over Capacity
	PM	1,763	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,289	Near Capacity
	PM	1,061	Under Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	839	Under Capacity
	PM	1,293	Near Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	701	Under Capacity
	PM	1,205	Near Capacity

APPENDIX E

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS AND ARTERIAL ANALYSIS WORKSHEETS - EXISTING + ENTIRE PROJECT

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
1: Clairemont Mesa Boulevard & Kearny Mesa Rd — 1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	607	23	268	1553	196	22	10	127	104	13	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.87	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5000		1770	1543	1504	3433	3166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5000		1770	1543	1504	3433	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	660	25	291	1688	213	24	11	138	113	14	33
RTOR Reduction (vph)	0	0	9	0	9	0	0	61	60	0	29	0
Lane Group Flow (vph)	35	660	16	291	1892	0	24	15	13	113	18	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	4.7	63.0	71.3	13.6	71.3		2.8	6.2	19.8	8.0	11.7	
Effective Green, g (s)	4.7	63.0	71.3	13.6	71.3		2.8	6.2	19.8	8.0	11.7	
Actuated g/C Ratio	0.04	0.57	0.65	0.12	0.65		0.03	0.06	0.18	0.07	0.11	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	76	2912	1026	424	3241		45	87	271	250	337	
v/s Ratio Prot	0.02	0.13		c0.08	c0.38		0.01	c0.01	0.01	c0.03	0.01	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.46	0.23	0.02	0.69	0.58		0.53	0.17	0.05	0.45	0.05	
Uniform Delay, d1	51.4	11.5	6.9	46.2	10.9		53.0	49.4	37.3	48.9	44.2	
Progression Factor	1.00	1.00	1.00	1.15	0.68		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.2	0.0	3.6	0.3		6.0	0.3	0.0	0.5	0.0	
Delay (s)	53.0	11.7	6.9	56.6	7.8		58.9	49.8	37.3	49.4	44.2	
Level of Service	D	B	A	E	A		E	D	D	D	D	
Approach Delay (s)		13.6			14.3			45.8			47.9	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	17.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp — 1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	608	230	0	1034	408	0	0	920	0	0	180
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	661	250	0	1124	443	0	0	1000	0	0	196
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.96			0.94			0.96	0.96	0.94	0.96	0.96	0.96
vC, conflicting volume	1567			911			1418	2228	330	2454	2035	562
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1515			774			1181	2028	155	2264	1825	473
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	62
cM capacity (veh/h)	422			786			87	54	809	0	73	518

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	330	330	250	562	562	443	1000	98	98
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	250	0	0	443	1000	98	98
cSH	1700	1700	1700	1700	1700	1700	809	518	518
Volume to Capacity	0.19	0.19	0.15	0.33	0.33	0.26	1.24	0.19	0.19
Queue Length 95th (ft)	0	0	0	0	0	0	866	17	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	135.1	13.6	13.6
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			135.1	13.6	
Approach LOS							F	B	

Intersection Summary			
Average Delay	37.5		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1323	205	0	620	172	822	0	711	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1438	223	0	674	187	893	0	773	0	0	0
RTOR Reduction (vph)	0	0	112	0	0	94	0	0	13	0	0	0
Lane Group Flow (vph)	0	1438	112	0	674	94	446	447	760	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		55.0	55.0		55.0	55.0	44.2	44.2	44.2			
Effective Green, g (s)		55.0	55.0		55.0	55.0	44.2	44.2	44.2			
Actuated g/C Ratio		0.50	0.50		0.50	0.50	0.40	0.40	0.40			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2543	792		2543	792	675	675	1120			
v/s Ratio Prot		c0.28			0.13		0.27	0.27	c0.27			
v/s Ratio Perm			0.07			0.06						
v/c Ratio		0.57	0.14		0.27	0.12	0.66	0.66	0.68			
Uniform Delay, d1		19.2	14.8		15.9	14.6	26.8	26.8	27.1			
Progression Factor		0.90	0.68		1.08	3.51	1.00	1.00	1.00			
Incremental Delay, d2		0.9	0.4		0.3	0.3	2.4	2.4	1.6			
Delay (s)		18.1	10.5		17.3	51.6	29.2	29.3	28.7			
Level of Service		B	B		B	D	C	C	C			
Approach Delay (s)		17.1			24.8			29.0			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	23.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
4: Clairemont Mesa Boulevard & Kearny Villa Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	1119	758	51	579	9	86	51	86	22	43	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.2
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	1216	824	55	629	10	93	55	93	24	47	138
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	37	0	0	126
Lane Group Flow (vph)	170	1216	824	55	629	1	93	55	56	24	47	12
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			4
Actuated Green, G (s)	14.1	66.4	110.0	7.8	60.0	11.8	7.2	11.8	66.4	4.8	9.6	9.6
Effective Green, g (s)	14.1	66.4	110.0	7.8	60.0	11.8	7.2	11.8	66.4	4.8	9.6	9.6
Actuated g/C Ratio	0.13	0.60	1.00	0.07	0.55	0.11	0.07	0.11	0.60	0.04	0.09	0.09
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	440	3069	1583	126	2774	170	225	200	956	77	163	138
v/s Ratio Prot	0.05	0.24		0.03	0.12		0.03	0.03		0.01	0.03	
v/s Ratio Perm			c0.52			0.00			0.04			0.01
v/c Ratio	0.39	0.40	0.52	0.44	0.23	0.01	0.41	0.28	0.06	0.31	0.29	0.09
Uniform Delay, d1	44.0	11.4	0.0	49.0	13.0	43.9	49.4	45.2	9.0	51.0	47.0	46.2
Progression Factor	0.91	1.67	1.00	1.21	0.60	1.49	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3	1.0	2.4	0.2	0.0	1.2	0.7	0.1	2.3	1.0	0.3
Delay (s)	40.5	19.2	1.0	61.6	7.9	65.3	50.6	45.9	9.1	53.3	48.0	46.4
Level of Service	D	B	A	E	A	E	D	D	A	D	D	D
Approach Delay (s)		14.1			13.0			33.5			47.6	
Approach LOS		B			B			C			D	

Intersection Summary				
HCM Average Control Delay	17.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	46.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
5: Clairemont Mesa Boulevard & Complex Street

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	736	98	61	552	79	37	2	36	44	1	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	4995		1770	4990			1778	1583		1776	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.70	1.00
Satd. Flow (perm)	1770	4995		1770	4990			1305	1583		1303	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	800	107	66	600	86	40	2	39	48	1	36
RTOR Reduction (vph)	0	9	0	0	9	0	0	0	36	0	0	33
Lane Group Flow (vph)	234	898	0	66	677	0	0	42	3	0	49	3
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	20.1	81.5		8.3	69.7			8.2	8.2		8.2	8.2
Effective Green, g (s)	20.1	81.5		8.3	69.7			8.2	8.2		8.2	8.2
Actuated g/C Ratio	0.18	0.74		0.08	0.63			0.07	0.07		0.07	0.07
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	323	3701		134	3162			97	118		97	118
v/s Ratio Prot	c0.13	c0.18		0.04	0.14							
v/s Ratio Perm								0.03	0.00		c0.04	0.00
v/c Ratio	0.72	0.24		0.49	0.21			0.43	0.02		0.51	0.02
Uniform Delay, d1	42.3	4.5		48.8	8.5			48.7	47.2		48.9	47.2
Progression Factor	1.60	0.10		0.64	1.44			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.5	0.1		2.6	0.1			3.1	0.1		4.1	0.1
Delay (s)	75.4	0.6		33.9	12.5			51.8	47.3		53.0	47.3
Level of Service	E	A		C	B			D	D		D	D
Approach Delay (s)		15.9			14.4			49.6			50.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
6: Clairemont Mesa Boulevard & Overland Avenue

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	132	690	69	116	571	39	101	43	38	28	16	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5016		3433	5085	1583	1770	3292		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5016		3433	5085	1583	1770	3292		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	750	75	126	621	42	110	47	41	30	17	49
RTOR Reduction (vph)	0	11	0	0	0	31	0	23	0	0	0	31
Lane Group Flow (vph)	143	814	0	126	621	11	110	65	0	30	17	18
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	9.0	30.1		8.7	29.7	29.7	11.7	48.5		4.0	40.8	40.8
Effective Green, g (s)	9.0	30.1		8.7	29.7	29.7	11.7	48.5		4.0	40.8	40.8
Actuated g/C Ratio	0.08	0.27		0.08	0.27	0.27	0.11	0.44		0.04	0.37	0.37
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	281	1373		272	1373	427	188	1451		64	691	587
v/s Ratio Prot	c0.04	c0.16		0.04	0.12		c0.06	c0.02		0.02	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.51	0.59		0.46	0.45	0.03	0.59	0.04		0.47	0.02	0.03
Uniform Delay, d1	48.4	34.6		48.4	33.4	29.5	46.8	17.5		52.0	22.0	22.0
Progression Factor	1.41	0.60		1.07	1.53	3.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	1.9		1.1	1.0	0.1	4.6	0.0		5.3	0.1	0.1
Delay (s)	69.6	22.7		52.7	52.0	88.9	51.4	17.6		57.3	22.0	22.1
Level of Service	E	C		D	D	F	D	B		E	C	C
Approach Delay (s)		29.7			54.1			36.4			33.1	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM Average Control Delay	39.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	238	351	205	472	574	206	121	208	70	205	474	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.94		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4804		3433	4884		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4804		3433	4884		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	382	223	513	624	224	132	226	76	223	515	136
RTOR Reduction (vph)	0	96	0	0	58	0	0	0	53	0	0	88
Lane Group Flow (vph)	259	509	0	513	790	0	132	226	23	223	515	48
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	12.5	33.0		16.6	37.2		8.2	33.0	33.0	7.8	32.8	32.8
Effective Green, g (s)	12.5	33.0		16.6	37.2		8.2	33.0	33.0	7.8	32.8	32.8
Actuated g/C Ratio	0.11	0.30		0.15	0.34		0.07	0.30	0.30	0.07	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	390	1441		518	1652		256	1062	475	243	1055	472
v/s Ratio Prot	0.08	0.11		c0.15	c0.16		0.04	0.06		c0.06	c0.15	
v/s Ratio Perm									0.01			0.03
v/c Ratio	0.66	0.35		0.99	0.48		0.52	0.21	0.05	0.92	0.49	0.10
Uniform Delay, d1	46.7	30.1		46.6	28.7		49.0	28.8	27.3	50.8	31.7	27.9
Progression Factor	1.08	2.09		0.90	0.90		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	0.6		36.3	1.0		1.8	0.5	0.2	35.9	1.6	0.4
Delay (s)	54.1	63.5		78.4	26.8		50.7	29.2	27.5	86.7	33.3	28.4
Level of Service	D	E		E	C		D	C	C	F	C	C
Approach Delay (s)		60.7			46.2			35.5			46.2	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	48.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.3	
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	617	110	451	1213	39	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	671	120	490	1318	42	171
RTOR Reduction (vph)	0	23	0	0	0	98
Lane Group Flow (vph)	671	97	490	1318	42	73
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	66.7	74.8	21.2	92.4	8.1	29.3
Effective Green, g (s)	66.7	74.8	21.2	92.4	8.1	29.3
Actuated g/C Ratio	0.61	0.68	0.19	0.84	0.07	0.27
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3083	1076	662	4271	130	854
v/s Ratio Prot	0.13	0.01	c0.14	c0.26	c0.02	0.02
v/s Ratio Perm		0.05				0.01
v/c Ratio	0.22	0.09	0.74	0.31	0.32	0.09
Uniform Delay, d1	9.8	6.0	41.8	1.9	48.3	30.3
Progression Factor	1.24	2.78	1.05	0.83	1.00	1.00
Incremental Delay, d2	0.1	0.0	4.3	0.2	1.4	0.0
Delay (s)	12.3	16.7	48.1	1.8	49.8	30.3
Level of Service	B	B	D	A	D	C
Approach Delay (s)	13.0			14.3	34.2	
Approach LOS	B			B	C	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	39.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	600	117	382	1414	51	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	652	127	415	1537	55	76
RTOR Reduction (vph)	0	0	30	0	0	0	20
Lane Group Flow (vph)	0	652	97	415	1537	55	56
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		56.2	56.2	30.7	91.9	7.7	38.4
Effective Green, g (s)		56.2	56.2	30.7	91.9	7.7	38.4
Actuated g/C Ratio		0.51	0.51	0.28	0.84	0.07	0.35
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1808	809	494	4248	124	553
v/s Ratio Prot		0.18		c0.23	c0.30	c0.03	0.03
v/s Ratio Perm			0.06				0.01
v/c Ratio		0.36	0.12	0.84	0.36	0.44	0.10
Uniform Delay, d1		16.1	14.0	37.3	2.1	49.1	24.2
Progression Factor		0.99	1.09	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.6	0.3	12.2	0.2	2.5	0.1
Delay (s)		16.6	15.6	49.5	2.4	51.6	24.2
Level of Service		B	B	D	A	D	C
Approach Delay (s)		16.4			12.4	35.7	
Approach LOS		B			B	D	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.7
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	334	336	462	1126	0	0	0	0	99	1	670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1447	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1447	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	363	365	502	1224	0	0	0	0	108	1	728
RTOR Reduction (vph)	0	0	248	0	0	0	0	0	0	0	31	31
Lane Group Flow (vph)	0	363	117	502	1224	0	0	0	0	97	338	340
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		36.5	32.1	19.4	59.9					32.1	32.1	32.1
Effective Green, g (s)		36.5	32.1	19.4	59.9					32.1	32.1	32.1
Actuated g/C Ratio		0.36	0.32	0.19	0.60					0.32	0.32	0.32
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1292	895	666	2120					540	464	483
v/s Ratio Prot		0.10		c0.15	c0.35					0.06	c0.23	
v/s Ratio Perm			0.04									0.23
v/c Ratio		0.28	0.13	0.75	0.58					0.18	0.73	0.70
Uniform Delay, d1		22.5	24.1	38.0	12.3					24.5	30.1	29.8
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	4.8	1.2					0.2	5.6	4.6
Delay (s)		22.6	24.1	42.9	13.4					24.6	35.7	34.4
Level of Service		C	C	D	B					C	D	C
Approach Delay (s)		23.4			22.0			0.0			33.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	166	267	0	0	566	198	1023	0	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3402		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3402		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	290	0	0	615	215	1112	0	183	0	0	0
RTOR Reduction (vph)	0	0	0	0	42	0	0	0	114	0	0	0
Lane Group Flow (vph)	180	290	0	0	788	0	1112	0	69	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	7.7	39.7			27.8		30.3		30.3			
Effective Green, g (s)	7.7	39.7			27.8		30.3		30.3			
Actuated g/C Ratio	0.10	0.50			0.35		0.38		0.38			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	330	1756			1182		1300		600			
v/s Ratio Prot	c0.05	0.08			c0.23		c0.32					
v/s Ratio Perm									0.04			
v/c Ratio	0.55	0.17			0.67		0.86		0.12			
Uniform Delay, d1	34.5	11.1			22.2		22.8		16.1			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	1.8	0.2			3.0		5.7		0.1			
Delay (s)	36.3	11.3			25.1		28.6		16.2			
Level of Service	D	B			C		C		B			
Approach Delay (s)		20.9			25.1			26.8			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	25.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	87.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
12: Lightwave Avenue & Overland Avenue

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	104	12	18	124	161	5	49	1	123	88	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.92		1.00	1.00		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3484		1770	3240		1770	3529		1770	3339	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3484		1770	3240		1770	3529		1770	3339	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	113	13	20	135	175	5	53	1	134	96	58
RTOR Reduction (vph)	0	9	0	0	129	0	0	1	0	0	44	0
Lane Group Flow (vph)	55	117	0	20	181	0	5	53	0	134	110	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.1	14.2		0.7	11.8		0.5	4.4		6.9	10.8	
Effective Green, g (s)	3.1	14.2		0.7	11.8		0.5	4.4		6.9	10.8	
Actuated g/C Ratio	0.07	0.32		0.02	0.26		0.01	0.10		0.15	0.24	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	122	1104		28	853		20	347		273	805	
v/s Ratio Prot	c0.03	0.03		0.01	c0.06		0.00	0.02		c0.08	c0.03	
v/s Ratio Perm												
v/c Ratio	0.45	0.11		0.71	0.21		0.25	0.15		0.49	0.14	
Uniform Delay, d1	20.0	10.8		22.0	12.9		22.0	18.5		17.3	13.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.0		52.5	0.1		2.4	0.2		0.5	0.1	
Delay (s)	21.0	10.9		74.4	13.0		24.3	18.7		17.8	13.4	
Level of Service	C	B		E	B		C	B		B	B	
Approach Delay (s)		13.9			16.7			19.2			15.5	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	44.8	Sum of lost time (s)	13.7	
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	303	356	141	306	349	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3526	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	387	153	333	379	10
RTOR Reduction (vph)	0	231	0	0	2	0
Lane Group Flow (vph)	329	156	153	333	387	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.7	20.7	12.0	48.0	31.8	
Effective Green, g (s)	20.7	20.7	12.0	48.0	31.8	
Actuated g/C Ratio	0.26	0.26	0.15	0.60	0.40	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	458	410	266	2123	1402	
v/s Ratio Prot	c0.19		c0.09	0.09	c0.11	
v/s Ratio Perm		0.10				
v/c Ratio	0.72	0.38	0.58	0.16	0.28	
Uniform Delay, d1	27.0	24.4	31.6	7.1	16.3	
Progression Factor	1.00	1.00	1.12	0.73	1.00	
Incremental Delay, d2	5.3	0.6	3.0	0.2	0.5	
Delay (s)	32.3	25.0	38.5	5.3	16.8	
Level of Service	C	C	D	A	B	
Approach Delay (s)	28.3			15.8	16.8	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	0	442	0	0	0	0	341	59	51	654	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	0	480	0	0	0	0	371	64	55	711	0
RTOR Reduction (vph)	0	0	280	0	0	0	0	0	27	0	0	0
Lane Group Flow (vph)	0	115	200	0	0	0	0	371	37	55	711	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		12.2	12.2					46.8	46.8	5.5	56.5	
Effective Green, g (s)		12.2	12.2					46.8	46.8	5.5	56.5	
Actuated g/C Ratio		0.15	0.15					0.58	0.58	0.07	0.71	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		270	425					2070	926	122	2499	
v/s Ratio Prot								0.10		c0.03	c0.20	
v/s Ratio Perm		0.06	c0.07						0.02			
v/c Ratio		0.43	0.47					0.18	0.04	0.45	0.28	
Uniform Delay, d1		30.7	31.0					7.7	7.1	35.8	4.3	
Progression Factor		1.00	1.00					1.00	1.00	0.94	0.96	
Incremental Delay, d2		1.1	0.8					0.2	0.1	2.5	0.3	
Delay (s)		31.8	31.8					7.9	7.1	36.0	4.4	
Level of Service		C	C					A	A	D	A	
Approach Delay (s)		31.8			0.0			7.8			6.7	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
15: Kearny Villa Road & Ruffin Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	30	36	6	3	9	17	276	49	76	800	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.98		1.00	0.97	
Flt Protected	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1720	1583	1770	1648		1770	3460		3433	3425	
Flt Permitted	0.95	0.97	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1720	1583	1770	1648		1770	3460		3433	3425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	33	39	7	3	10	18	300	53	83	870	239
RTOR Reduction (vph)	0	0	34	0	10	0	0	19	0	0	30	0
Lane Group Flow (vph)	79	79	5	7	3	0	18	334	0	83	1079	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.4	6.4	6.4	1.0	1.0		0.5	22.9		2.5	24.9	
Effective Green, g (s)	6.4	6.4	6.4	1.0	1.0		0.5	22.9		2.5	24.9	
Actuated g/C Ratio	0.13	0.13	0.13	0.02	0.02		0.01	0.47		0.05	0.51	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	226	208	36	34		18	1624		176	1748	
v/s Ratio Prot	c0.05	0.05		c0.00	0.00		0.01	0.10		c0.02	c0.31	
v/s Ratio Perm			0.00									
v/c Ratio	0.36	0.35	0.02	0.19	0.09		1.00	0.21		0.47	0.62	
Uniform Delay, d1	19.3	19.3	18.5	23.5	23.5		24.1	7.6		22.5	8.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.9	0.0	2.6	1.2		212.1	0.1		2.0	0.7	
Delay (s)	20.3	20.2	18.5	26.1	24.7		236.3	7.7		24.5	9.2	
Level of Service	C	C	B	C	C		F	A		C	A	
Approach Delay (s)		19.9			25.2			18.8			10.3	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM Average Control Delay	13.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
16: Chesapeake Drive & Ruffin Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	37	19	15	31	63	35	283	25	98	790	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1843	1583		1833	1583	1770	3496		1770	3503	
Flt Permitted		0.91	1.00		0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1698	1583		1627	1583	1770	3496		1770	3503	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	40	21	16	34	68	38	308	27	107	859	63
RTOR Reduction (vph)	0	0	19	0	0	60	0	6	0	0	5	0
Lane Group Flow (vph)	0	51	2	0	50	8	38	329	0	107	917	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		4.8	4.8		5.4	5.4	1.8	19.9		5.9	24.0	
Effective Green, g (s)		4.8	4.8		5.4	5.4	1.8	19.9		5.9	24.0	
Actuated g/C Ratio		0.10	0.10		0.12	0.12	0.04	0.43		0.13	0.52	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		178	166		192	187	70	1519		228	1836	
v/s Ratio Prot							0.02	0.09		c0.06	c0.26	
v/s Ratio Perm		0.03	0.00		c0.03	0.01						
v/c Ratio		0.29	0.01		0.26	0.04	0.54	0.22		0.47	0.50	
Uniform Delay, d1		18.9	18.4		18.4	17.9	21.6	8.1		18.5	7.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.0		0.3	0.0	4.5	0.1		0.6	0.3	
Delay (s)		19.2	18.4		18.6	17.9	26.1	8.2		19.1	7.4	
Level of Service		B	B		B	B	C	A		B	A	
Approach Delay (s)		19.0			18.2			10.0			8.6	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM Average Control Delay	10.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	45.8	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
17: Hazard Way & Ruffin Road
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	21	2	0	0	41	366	5	6	723	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3533		1770	3491	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3533		1770	3491	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	23	2	0	0	45	398	5	7	786	78
RTOR Reduction (vph)	0	22	0	0	0	0	0	1	0	0	5	0
Lane Group Flow (vph)	24	1	0	0	2	0	45	402	0	7	859	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.9	1.9			0.8		1.1	20.7		0.5	20.1	
Effective Green, g (s)	1.9	1.9			0.8		1.1	20.7		0.5	20.1	
Actuated g/C Ratio	0.04	0.04			0.02		0.03	0.48		0.01	0.46	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	77	69			33		87	1685		20	1617	
v/s Ratio Prot	c0.01	0.00			c0.00		c0.01	0.11		0.00	c0.25	
v/s Ratio Perm												
v/c Ratio	0.31	0.01			0.06		0.52	0.24		0.35	0.53	
Uniform Delay, d1	20.1	19.9			20.9		20.9	6.7		21.3	8.3	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.0			0.3		2.2	0.2		3.8	0.7	
Delay (s)	21.0	19.9			21.2		23.0	6.9		25.1	9.0	
Level of Service	C	B			C		C	A		C	A	
Approach Delay (s)		20.4			21.2			8.5			9.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	43.4	Sum of lost time (s)	19.5
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj AM (Year 2030)
18: Farnham St & Ruffin Road
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	11	14	23	13	7	131	420	82	34	630	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1805	1583	3433	3453		1770	3489	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1863	1583		1863	1583	3433	3453		1770	3489	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	12	15	25	14	8	142	457	89	37	685	72
RTOR Reduction (vph)	0	0	14	0	0	8	0	13	0	0	7	0
Lane Group Flow (vph)	0	38	1	0	39	0	142	533	0	37	750	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		2.1	2.1		2.1	2.1	4.1	24.8		1.7	22.4	
Effective Green, g (s)		2.1	2.1		2.1	2.1	4.1	24.8		1.7	22.4	
Actuated g/C Ratio		0.05	0.05		0.05	0.05	0.09	0.57		0.04	0.52	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		91	77		91	77	326	1982		70	1809	
v/s Ratio Prot							c0.04	0.15		0.02	c0.21	
v/s Ratio Perm		0.02	0.00		c0.02	0.00						
v/c Ratio		0.42	0.01		0.43	0.01	0.44	0.27		0.53	0.41	
Uniform Delay, d1		20.0	19.6		20.0	19.6	18.5	4.6		20.4	6.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		1.2	0.0	0.3	0.2		3.3	0.4	
Delay (s)		21.1	19.6		21.1	19.6	18.8	4.8		23.7	6.8	
Level of Service		C	B		C	B	B	A		C	A	
Approach Delay (s)		20.7			20.9			7.7			7.6	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	28	371	80	0	1177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	30	403	87	0	1279
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.89					
vC, conflicting volume	1043	202			490	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	793	202			490	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	289	806			1069	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	30	202	202	87	640	640
Volume Left	0	0	0	0	0	0
Volume Right	30	0	0	87	0	0
cSH	806	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.12	0.12	0.05	0.38	0.38
Queue Length 95th (ft)	3	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.6	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		35.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	83	81	47	45	124	175	266	102	354	561	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1658		3433	3392		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1658		3433	3392		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	90	88	51	49	135	190	289	111	385	610	285
RTOR Reduction (vph)	0	0	60	0	108	0	0	37	0	0	0	163
Lane Group Flow (vph)	64	90	28	51	76	0	190	363	0	385	610	122
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	4.2	12.4	21.8	3.2	12.0		9.4	13.7		20.6	24.9	29.1
Effective Green, g (s)	4.2	12.4	21.8	3.2	12.0		9.4	13.7		20.6	24.9	29.1
Actuated g/C Ratio	0.06	0.18	0.32	0.05	0.18		0.14	0.20		0.30	0.37	0.43
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	212	340	507	83	293		475	683		536	1296	677
v/s Ratio Prot	0.02	c0.05	0.01	c0.03	0.05		0.06	0.11		c0.22	c0.17	0.01
v/s Ratio Perm			0.01									0.07
v/c Ratio	0.30	0.26	0.06	0.61	0.26		0.40	0.53		0.72	0.47	0.18
Uniform Delay, d1	30.5	23.9	16.0	31.8	24.2		26.7	24.3		21.1	16.5	12.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.4	0.0	12.8	0.5		0.6	0.8		4.6	0.3	0.1
Delay (s)	31.3	24.3	16.0	44.5	24.6		27.3	25.1		25.7	16.8	12.2
Level of Service	C	C	B	D	C		C	C		C	B	B
Approach Delay (s)		23.1			29.0			25.8			18.4	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay		21.8	HCM Level of Service	C
HCM Volume to Capacity ratio		0.46		
Actuated Cycle Length (s)		68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization		58.1%	ICU Level of Service	B
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	3	79	9	0	5	261	590	40	12	470	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3506		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3506		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	3	86	10	0	5	284	641	43	13	511	113
RTOR Reduction (vph)	0	0	66	0	0	5	0	4	0	0	0	72
Lane Group Flow (vph)	30	3	20	0	10	0	284	680	0	13	511	41
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	1.8	1.8	11.6		0.3	0.3	9.8	27.4		0.5	18.1	18.1
Effective Green, g (s)	1.8	1.8	11.6		0.3	0.3	9.8	27.4		0.5	18.1	18.1
Actuated g/C Ratio	0.04	0.04	0.23		0.01	0.01	0.20	0.55		0.01	0.36	0.36
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	123	67	367		11	9	672	1917		18	1279	572
v/s Ratio Prot	c0.01	0.00	0.01		c0.01		c0.08	c0.19		0.01	0.14	
v/s Ratio Perm			0.00			0.00						0.03
v/c Ratio	0.24	0.04	0.05		0.91	0.00	0.42	0.35		0.72	0.40	0.07
Uniform Delay, d1	23.5	23.3	15.0		24.9	24.8	17.7	6.4		24.7	11.9	10.5
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.3	0.1		217.6	0.1	0.4	0.1		87.1	0.2	0.1
Delay (s)	24.5	23.6	15.0		242.4	24.9	18.1	6.5		111.8	12.1	10.5
Level of Service	C	C	B		F	C	B	A		F	B	B
Approach Delay (s)		17.6			169.9			9.9			13.9	
Approach LOS		B			F			A			B	

Intersection Summary				
HCM Average Control Delay	13.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	50.1	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	41.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	245	392	584	838	531	95	280	66	99	272	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4616		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4616		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	266	426	635	911	577	103	304	72	108	296	107
RTOR Reduction (vph)	0	248	0	0	0	302	0	0	59	0	0	87
Lane Group Flow (vph)	200	444	0	635	911	275	103	304	14	108	296	20
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	14.4	15.0		22.9	23.7	30.3	6.5	15.0	15.0	6.6	15.2	15.2
Effective Green, g (s)	14.4	15.0		22.9	23.7	30.3	6.5	15.0	15.0	6.6	15.2	15.2
Actuated g/C Ratio	0.18	0.19		0.29	0.30	0.38	0.08	0.19	0.19	0.08	0.19	0.19
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	319	866		507	1506	1056	279	664	297	283	672	301
v/s Ratio Prot	0.11	0.10		c0.36	c0.18	0.02	0.03	c0.09		c0.03	0.08	
v/s Ratio Perm						0.08			0.01			0.01
v/c Ratio	0.63	0.51		1.25	0.60	0.26	0.37	0.46	0.05	0.38	0.44	0.07
Uniform Delay, d1	30.3	29.2		28.6	24.1	17.1	34.8	28.9	26.6	34.8	28.6	26.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.5		129.1	0.7	0.1	0.8	0.5	0.1	0.9	0.5	0.1
Delay (s)	34.1	29.7		157.7	24.8	17.3	35.6	29.4	26.7	35.6	29.1	26.7
Level of Service	C	C		F	C	B	D	C	C	D	C	C
Approach Delay (s)		30.7			62.5			30.3			30.0	
Approach LOS		C			E			C			C	

Intersection Summary				
HCM Average Control Delay	47.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	74.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	257	31	348	1929	482	4	13	35	98	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5002		1770	6216			1842	1583	1770	1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	0.75	1.00	
Satd. Flow (perm)	1770	5002		1770	6216			1770	1583	1389	1651	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	279	34	378	2097	524	4	14	38	107	7	22
RTOR Reduction (vph)	0	9	0	0	28	0	0	0	33	0	19	0
Lane Group Flow (vph)	114	304	0	378	2593	0	0	18	5	107	10	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	9.4	39.3		23.1	54.0			12.3	12.3	12.3	12.3	
Effective Green, g (s)	9.4	39.3		23.1	54.0			12.3	12.3	12.3	12.3	
Actuated g/C Ratio	0.10	0.43		0.25	0.59			0.14	0.14	0.14	0.14	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	183	2158		449	3685			239	214	188	223	
v/s Ratio Prot	0.06	0.06		c0.21	c0.42						0.01	
v/s Ratio Perm								0.01	0.00	c0.08		
v/c Ratio	0.62	0.14		0.84	0.70			0.08	0.02	0.57	0.04	
Uniform Delay, d1	39.2	15.7		32.3	13.0			34.4	34.2	36.9	34.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.5	0.0		13.4	0.6			0.1	0.0	3.9	0.1	
Delay (s)	45.6	15.7		45.6	13.6			34.6	34.2	40.8	34.4	
Level of Service	D	B		D	B			C	C	D	C	
Approach Delay (s)		23.7			17.6			34.3			39.5	
Approach LOS		C			B			C			D	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Entire Proj AM (Year 2030)
1/3/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	150	239	96	50	18	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	260	104	54	20	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	159				717	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159				717	132
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				94	94
cM capacity (veh/h)	1421				351	918

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	260	159	77
Volume Left	163	0	0	20
Volume Right	0	0	54	58
cSH	1421	1700	1700	651
Volume to Capacity	0.11	0.15	0.09	0.12
Queue Length 95th (ft)	10	0	0	10
Control Delay (s)	7.9	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	3.0		0.0	11.3
Approach LOS				B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	30	227	135	30	11	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	247	147	33	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	179				475	163
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	179				475	163
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	99
cM capacity (veh/h)	1396				536	882

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	247	179	24
Volume Left	33	0	0	12
Volume Right	0	0	33	12
cSH	1396	1700	1700	666
Volume to Capacity	0.02	0.15	0.11	0.04
Queue Length 95th (ft)	2	0	0	3
Control Delay (s)	7.6	0.0	0.0	10.6
Lane LOS	A			B
Approach Delay (s)	0.9		0.0	10.6
Approach LOS				B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
1: Clairemont Mesa Boulevard & Kearny Mesa Rd — 1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1538	58	152	1044	95	40	9	496	218	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5022		1770	1514	1504	3433	3137	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5022		1770	1514	1504	3433	3137	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1672	63	165	1135	103	43	10	539	237	16	50
RTOR Reduction (vph)	0	0	19	0	6	0	0	184	13	0	42	0
Lane Group Flow (vph)	54	1672	44	165	1232	0	43	90	262	237	24	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.4	74.5	81.1	14.6	81.1		6.4	13.4	28.0	13.3	20.6	
Effective Green, g (s)	7.4	74.5	81.1	14.6	81.1		6.4	13.4	28.0	13.3	20.6	
Actuated g/C Ratio	0.05	0.55	0.60	0.11	0.60		0.05	0.10	0.21	0.10	0.15	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	97	2806	951	371	3017		84	150	312	338	479	
v/s Ratio Prot	0.03	c0.33		0.05	0.25		0.02	0.06	c0.09	c0.07	0.01	
v/s Ratio Perm			0.03						0.08			
v/c Ratio	0.56	0.60	0.05	0.44	0.41		0.51	0.60	0.84	0.70	0.05	
Uniform Delay, d1	62.2	20.2	11.1	56.4	14.3		62.8	58.2	51.3	58.9	48.8	
Progression Factor	1.00	1.00	1.00	1.05	0.81		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.9	0.9	0.0	0.3	0.1		2.2	4.6	16.8	5.3	0.0	
Delay (s)	66.1	21.1	11.1	59.3	11.6		65.0	62.8	68.2	64.2	48.9	
Level of Service	E	C	B	E	B		E	E	E	E	D	
Approach Delay (s)		22.1			17.2			65.5			60.9	
Approach LOS		C			B			E			E	

Intersection Summary				
HCM Average Control Delay	29.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp — 1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1432	820	0	804	800	0	0	261	0	0	52
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1557	891	0	874	870	0	0	284	0	0	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	1743			2448			2050	3300	778	1936	3322	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1743			2294			1786	3383	161	1640	3411	437
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	58	100	100	90
cM capacity (veh/h)	356			170			36	6	669	30	6	567

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	778	778	891	437	437	870	284	28	28
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	891	0	0	870	284	28	28
cSH	1700	1700	1700	1700	1700	1700	669	567	567
Volume to Capacity	0.46	0.46	0.52	0.26	0.26	0.51	0.42	0.05	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	53	4	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.3	11.7	11.7
Lane LOS							B	B	B
Approach Delay (s)	0.0			0.0			14.3	11.7	
Approach LOS							B	B	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	888	805	0	1389	557	215	0	307	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	965	875	0	1510	605	234	0	334	0	0	0
RTOR Reduction (vph)	0	0	170	0	0	118	0	0	296	0	0	0
Lane Group Flow (vph)	0	965	705	0	1510	487	117	117	38	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		108.7	108.7		108.7	108.7	15.5	15.5	15.5			
Effective Green, g (s)		108.7	108.7		108.7	108.7	15.5	15.5	15.5			
Actuated g/C Ratio		0.81	0.81		0.81	0.81	0.11	0.11	0.11			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		4094	1275		4094	1275	193	193	320			
v/s Ratio Prot		0.19			0.30		c0.07	0.07	0.01			
v/s Ratio Perm			c0.44			0.31						
v/c Ratio		0.24	0.55		0.37	0.38	0.61	0.61	0.12			
Uniform Delay, d1		3.2	4.6		3.6	3.7	56.8	56.8	53.6			
Progression Factor		0.65	3.61		1.98	17.42	1.00	1.00	1.00			
Incremental Delay, d2		0.1	1.5		0.2	0.8	5.3	5.3	0.2			
Delay (s)		2.2	18.2		7.4	65.2	62.1	62.1	53.8			
Level of Service		A	B		A	E	E	E	D			
Approach Delay (s)		9.8			24.0			57.2			0.0	
Approach LOS		A			C			E			A	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
4: Clairemont Mesa Boulevard & Kearny Villa Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	807	214	91	1592	6	103	62	103	33	71	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	877	233	99	1730	7	112	67	112	36	77	273
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	42	0	0	102
Lane Group Flow (vph)	188	877	233	99	1730	5	112	67	70	36	77	171
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	12.7	84.8	135.0	12.8	84.8	11.1	8.5	11.1	84.8	7.1	9.9	84.8
Effective Green, g (s)	12.7	84.8	135.0	12.8	84.8	11.1	8.5	11.1	84.8	7.1	9.9	84.8
Actuated g/C Ratio	0.09	0.63	1.00	0.09	0.63	0.08	0.06	0.08	0.63	0.05	0.07	0.63
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	323	3194	1583	168	3194	130	216	153	994	93	137	994
v/s Ratio Prot	0.05	0.17		c0.06	c0.34		c0.03	0.04		0.02	c0.04	
v/s Ratio Perm			c0.15			0.00			0.04			0.11
v/c Ratio	0.58	0.27	0.15	0.59	0.54	0.04	0.52	0.44	0.07	0.39	0.56	0.17
Uniform Delay, d1	58.6	11.3	0.0	58.6	14.1	57.0	61.3	59.0	9.8	61.8	60.5	10.5
Progression Factor	0.95	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.2	0.2	5.2	0.7	0.1	2.1	2.0	0.1	2.7	5.2	0.4
Delay (s)	58.5	11.9	0.2	63.8	14.8	57.2	63.4	61.0	9.9	64.5	65.6	10.8
Level of Service	E	B	A	E	B	E	E	E	A	E	E	B
Approach Delay (s)		16.5			17.6			42.2			26.8	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	20.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
5: Clairemont Mesa Boulevard & Complex Street

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	743	28	41	943	28	88	3	28	58	3	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	5058		1770	5064			1777	1583		1778	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.68	1.00		0.53	1.00
Satd. Flow (perm)	1770	5058		1770	5064			1275	1583		980	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	808	30	45	1025	30	96	3	30	63	3	78
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	28	0	0	72
Lane Group Flow (vph)	105	835	0	45	1053	0	0	99	2	0	66	6
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.8	81.9		7.1	77.2			9.0	9.0		9.0	9.0
Effective Green, g (s)	11.8	81.9		7.1	77.2			9.0	9.0		9.0	9.0
Actuated g/C Ratio	0.11	0.74		0.06	0.70			0.08	0.08		0.08	0.08
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	190	3766		114	3554			104	130		80	130
v/s Ratio Prot	c0.06	0.17		0.03	c0.21							
v/s Ratio Perm								c0.08	0.00		0.07	0.00
v/c Ratio	0.55	0.22		0.39	0.30			0.95	0.02		0.82	0.05
Uniform Delay, d1	46.6	4.3		49.4	6.2			50.3	46.4		49.7	46.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.5	0.1		2.2	0.2			72.5	0.1		47.2	0.2
Delay (s)	50.0	4.4		51.6	6.4			122.8	46.5		96.9	46.7
Level of Service	D	A		D	A			F	D		F	D
Approach Delay (s)		9.5			8.2			105.0			69.7	
Approach LOS		A			A			F			E	

Intersection Summary				
HCM Average Control Delay	18.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
6: Clairemont Mesa Boulevard & Overland Avenue

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	833	46	151	805	23	165	28	101	53	20	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5045		3433	5085	1583	1770	3122		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5045		3433	5085	1583	1770	3122		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	905	50	164	875	25	179	30	110	58	22	134
RTOR Reduction (vph)	0	4	0	0	0	13	0	63	0	0	0	88
Lane Group Flow (vph)	63	951	0	164	875	12	179	77	0	58	22	46
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	5.3	39.2		11.5	45.3	45.3	18.9	57.4		8.2	46.7	46.7
Effective Green, g (s)	5.3	39.2		11.5	45.3	45.3	18.9	57.4		8.2	46.7	46.7
Actuated g/C Ratio	0.04	0.29		0.09	0.34	0.34	0.14	0.43		0.06	0.35	0.35
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	135	1465		292	1706	531	248	1327		108	644	548
v/s Ratio Prot	0.02	c0.19		c0.05	0.17		c0.10	0.02		0.03	0.01	
v/s Ratio Perm						0.01						c0.03
v/c Ratio	0.47	0.65		0.56	0.51	0.02	0.72	0.06		0.54	0.03	0.08
Uniform Delay, d1	63.5	41.9		59.3	36.0	30.0	55.5	22.9		61.6	29.2	29.7
Progression Factor	1.00	1.00		1.03	1.27	1.88	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	2.2		2.2	1.0	0.1	9.9	0.0		5.1	0.1	0.3
Delay (s)	66.0	44.1		63.1	46.7	56.5	65.4	22.9		66.6	29.3	30.1
Level of Service	E	D		E	D	E	E	C		E	C	C
Approach Delay (s)		45.5			49.4			46.8			39.9	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	46.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.7	
Intersection Capacity Utilization	52.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Entire Proj PM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	806	155	238	474	107	341	577	216	416	413	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4963		3433	4945		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4963		3433	4945		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	284	876	168	259	515	116	371	627	235	452	449	170
RTOR Reduction (vph)	0	20	0	0	26	0	0	0	157	0	0	101
Lane Group Flow (vph)	284	1024	0	259	605	0	371	627	78	452	449	69
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	15.7	40.7		14.7	39.8		19.2	37.4	37.4	22.6	41.0	41.0
Effective Green, g (s)	15.7	40.7		14.7	39.8		19.2	37.4	37.4	22.6	41.0	41.0
Actuated g/C Ratio	0.12	0.30		0.11	0.29		0.14	0.28	0.28	0.17	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	399	1496		374	1458		488	980	439	575	1075	481
v/s Ratio Prot	c0.08	c0.21		0.08	0.12		0.11	c0.18		c0.13	c0.13	
v/s Ratio Perm									0.05			0.04
v/c Ratio	0.71	0.68		0.69	0.41		0.76	0.64	0.18	0.79	0.42	0.14
Uniform Delay, d1	57.5	41.5		58.0	38.2		55.7	42.9	37.1	53.9	37.5	34.2
Progression Factor	1.20	1.32		0.94	0.89		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	2.3		5.4	0.9		6.9	3.2	0.9	7.0	1.2	0.6
Delay (s)	74.2	57.2		60.1	35.0		62.5	46.1	38.0	60.9	38.7	34.8
Level of Service	E	E		E	D		E	D	D	E	D	C
Approach Delay (s)		60.8			42.3			49.5			47.4	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	50.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.8	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Ex + Entire Proj PM (Year 2030)
1/3/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1463	59	297	680	139	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1590	64	323	739	151	753
RTOR Reduction (vph)	0	19	0	0	0	10
Lane Group Flow (vph)	1590	45	323	739	151	743
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	77.6	94.5	26.5	108.6	16.9	43.4
Effective Green, g (s)	77.6	94.5	26.5	108.6	16.9	43.4
Actuated g/C Ratio	0.57	0.70	0.20	0.80	0.13	0.32
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2923	1108	674	4091	222	987
v/s Ratio Prot	c0.31	0.01	0.09	0.15	0.09	c0.15
v/s Ratio Perm		0.02				0.12
v/c Ratio	0.54	0.04	0.48	0.18	0.68	0.75
Uniform Delay, d1	17.8	6.3	48.1	3.0	56.5	41.0
Progression Factor	1.02	0.03	1.17	0.86	1.00	1.00
Incremental Delay, d2	0.6	0.0	0.5	0.1	8.3	3.3
Delay (s)	18.6	0.2	56.8	2.7	64.7	44.3
Level of Service	B	A	E	A	E	D
Approach Delay (s)	17.9			19.1	47.7	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	25.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1641	83	194	779	116	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1784	90	211	847	126	460
RTOR Reduction (vph)	0	0	8	0	0	0	6
Lane Group Flow (vph)	0	1784	82	211	847	126	454
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		77.8	77.8	26.8	109.6	15.0	41.8
Effective Green, g (s)		77.8	77.8	26.8	109.6	15.0	41.8
Actuated g/C Ratio		0.58	0.58	0.20	0.81	0.11	0.31
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2040	912	351	4128	197	490
v/s Ratio Prot		c0.50		0.12	0.17	0.07	c0.18
v/s Ratio Perm			0.05				0.10
v/c Ratio		0.87	0.09	0.60	0.21	0.64	0.93
Uniform Delay, d1		24.4	12.8	49.2	2.9	57.4	45.1
Progression Factor		0.88	0.82	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5	0.2	2.9	0.1	6.7	23.5
Delay (s)		25.9	10.6	52.1	3.0	64.1	68.6
Level of Service		C	B	D	A	E	E
Approach Delay (s)		25.2			12.8	67.6	
Approach LOS		C			B	E	

Intersection Summary			
HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1270	794	207	724	0	0	0	0	777	7	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1606	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1606	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1380	863	225	787	0	0	0	0	845	8	271
RTOR Reduction (vph)	0	0	476	0	0	0	0	0	0	0	3	114
Lane Group Flow (vph)	0	1380	387	225	787	0	0	0	0	439	438	130
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		35.9	35.9	7.2	47.1					24.9	24.9	24.9
Effective Green, g (s)		35.9	35.9	7.2	47.1					24.9	24.9	24.9
Actuated g/C Ratio		0.45	0.45	0.09	0.59					0.31	0.31	0.31
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1588	1251	309	2084					523	500	468
v/s Ratio Prot		c0.39		c0.07	0.22					0.26	c0.27	
v/s Ratio Perm			0.14									0.09
v/c Ratio		0.87	0.31	0.73	0.38					0.84	0.88	0.28
Uniform Delay, d1		19.9	14.1	35.4	8.7					25.7	26.1	20.8
Progression Factor		1.00	1.00	1.28	0.93					1.00	1.00	1.00
Incremental Delay, d2		5.4	0.1	7.1	0.4					11.3	15.8	0.3
Delay (s)		25.3	14.3	52.5	8.5					37.0	41.9	21.1
Level of Service		C	B	D	A					D	D	C
Approach Delay (s)		21.0			18.3			0.0			35.5	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	591	1456	0	0	521	86	410	0	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3464		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3464		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	642	1583	0	0	566	93	446	0	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	36	0	0	0
Lane Group Flow (vph)	642	1583	0	0	644	0	446	0	157	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	20.0	55.1			30.9		14.9		14.9			
Effective Green, g (s)	20.0	55.1			30.9		14.9		14.9			
Actuated g/C Ratio	0.25	0.69			0.39		0.19		0.19			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	858	2437			1338		639		295			
v/s Ratio Prot	c0.19	c0.45			0.19		c0.13					
v/s Ratio Perm									0.10			
v/c Ratio	0.75	0.65			0.48		0.70		0.53			
Uniform Delay, d1	27.7	7.0			18.5		30.4		29.4			
Progression Factor	0.92	1.79			1.00		1.00		1.00			
Incremental Delay, d2	1.8	0.7			1.2		3.3		1.8			
Delay (s)	27.2	13.3			19.8		33.8		31.3			
Level of Service	C	B			B		C		C			
Approach Delay (s)		17.3			19.8			33.0			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
12: Lightwave Avenue & Overland Avenue

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	77	0	6	133	174	46	122	18	204	31	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00		1.00	0.92		1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539		1770	3239		1770	3470		1770	3295	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539		1770	3239		1770	3470		1770	3295	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	84	0	7	145	189	50	133	20	222	34	29
RTOR Reduction (vph)	0	0	0	0	150	0	0	14	0	0	20	0
Lane Group Flow (vph)	67	84	0	7	184	0	50	139	0	222	43	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.8	13.7		0.6	10.5		2.2	7.7		10.5	16.0	
Effective Green, g (s)	3.8	13.7		0.6	10.5		2.2	7.7		10.5	16.0	
Actuated g/C Ratio	0.07	0.27		0.01	0.21		0.04	0.15		0.21	0.31	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	132	949		21	666		76	523		364	1032	
v/s Ratio Prot	c0.04	c0.02		0.00	c0.06		0.03	c0.04		c0.13	0.01	
v/s Ratio Perm												
v/c Ratio	0.51	0.09		0.33	0.28		0.66	0.26		0.61	0.04	
Uniform Delay, d1	22.7	14.0		25.1	17.1		24.1	19.2		18.4	12.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.0		3.4	0.3		14.6	0.3		2.0	0.0	
Delay (s)	23.9	14.1		28.4	17.3		38.6	19.5		20.4	12.2	
Level of Service	C	B		C	B		D	B		C	B	
Approach Delay (s)		18.4			17.6			24.2			18.6	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	23.5
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	70	494	956	726	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	0.88	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	2787	1770	3539	3526	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	2787	1770	3539	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	76	537	1039	789	20
RTOR Reduction (vph)	0	68	0	0	2	0
Lane Group Flow (vph)	88	8	537	1039	807	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	8.1	8.1	28.6	60.6	27.8	
Effective Green, g (s)	8.1	8.1	28.6	60.6	27.8	
Actuated g/C Ratio	0.10	0.10	0.36	0.76	0.35	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	179	282	633	2681	1225	
v/s Ratio Prot	c0.05		c0.30	0.29	c0.23	
v/s Ratio Perm		0.00				
v/c Ratio	0.49	0.03	0.85	0.39	0.66	
Uniform Delay, d1	34.0	32.4	23.7	3.3	22.1	
Progression Factor	1.00	1.00	0.82	3.51	1.00	
Incremental Delay, d2	2.1	0.0	1.0	0.0	2.8	
Delay (s)	36.1	32.4	20.5	11.7	24.9	
Level of Service	D	C	C	B	C	
Approach Delay (s)	34.4			14.7	24.9	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	5	195	0	0	0	0	1294	404	415	381	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1776	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1776	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	5	212	0	0	0	0	1407	439	451	414	0
RTOR Reduction (vph)	0	0	178	0	0	0	0	0	276	0	0	0
Lane Group Flow (vph)	0	175	34	0	0	0	0	1407	163	451	414	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		12.8	12.8					29.7	29.7	22.0	55.9	
Effective Green, g (s)		12.8	12.8					29.7	29.7	22.0	55.9	
Actuated g/C Ratio		0.16	0.16					0.37	0.37	0.28	0.70	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		284	446					1314	588	487	2473	
v/s Ratio Prot								c0.40		c0.25	0.12	
v/s Ratio Perm		0.10	0.01						0.10			
v/c Ratio		0.62	0.08					1.07	0.28	0.93	0.17	
Uniform Delay, d1		31.3	28.6					25.1	17.6	28.2	4.1	
Progression Factor		1.00	1.00					1.00	1.00	1.34	1.66	
Incremental Delay, d2		3.9	0.1					46.2	1.2	20.3	0.1	
Delay (s)		35.3	28.6					71.3	18.8	58.1	7.0	
Level of Service		D	C					E	B	E	A	
Approach Delay (s)		31.6			0.0			58.8			33.6	
Approach LOS		C			A			E			C	

Intersection Summary			
HCM Average Control Delay	48.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
15: Kearny Villa Road & Ruffin Road
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	341	4	17	43	32	82	18	1275	4	14	480	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1687	1583	1770	1662		1770	3538		3433	3462	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1687	1583	1770	1662		1770	3538		3433	3462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	371	4	18	47	35	89	20	1386	4	15	522	89
RTOR Reduction (vph)	0	0	14	0	84	0	0	0	0	0	20	0
Lane Group Flow (vph)	189	186	4	47	40	0	20	1390	0	15	591	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.7	10.7	10.7	3.0	3.0		0.6	20.6		0.6	20.6	
Effective Green, g (s)	10.7	10.7	10.7	3.0	3.0		0.6	20.6		0.6	20.6	
Actuated g/C Ratio	0.21	0.21	0.21	0.06	0.06		0.01	0.40		0.01	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	355	333	104	98		21	1432		40	1401	
v/s Ratio Prot	c0.11	0.11		c0.03	0.02		c0.01	c0.39		0.00	0.17	
v/s Ratio Perm			0.00									
v/c Ratio	0.54	0.52	0.01	0.45	0.41		0.95	0.97		0.38	0.42	
Uniform Delay, d1	17.9	17.8	15.9	23.2	23.1		25.1	14.9		25.0	10.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	1.4	0.0	3.1	2.8		173.4	17.2		5.8	0.2	
Delay (s)	19.5	19.2	15.9	26.3	25.9		198.6	32.1		30.8	11.1	
Level of Service	B	B	B	C	C		F	C		C	B	
Approach Delay (s)		19.2			26.0			34.4			11.6	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM Average Control Delay	26.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
16: Chesapeake Drive & Ruffin Road
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	14	70	92	52	167	28	961	20	37	512	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794	1583		1805	1583	1770	3528		1770	3516	
Flt Permitted		0.68	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1259	1583		1431	1583	1770	3528		1770	3516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	15	76	100	57	182	30	1045	22	40	557	25
RTOR Reduction (vph)	0	0	62	0	0	115	0	1	0	0	3	0
Lane Group Flow (vph)	0	65	14	0	157	67	30	1066	0	40	579	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.9	10.9		11.5	11.5	1.1	30.1		1.8	30.8	
Effective Green, g (s)		10.9	10.9		11.5	11.5	1.1	30.1		1.8	30.8	
Actuated g/C Ratio		0.19	0.19		0.20	0.20	0.02	0.52		0.03	0.53	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		237	297		284	314	34	1831		55	1867	
v/s Ratio Prot							0.02	c0.30		c0.02	0.16	
v/s Ratio Perm		0.05	0.01		c0.11	0.04						
v/c Ratio		0.27	0.05		0.55	0.21	0.88	0.58		0.73	0.31	
Uniform Delay, d1		20.2	19.3		20.9	19.5	28.4	9.6		27.9	7.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.0		1.3	0.1	104.6	0.6		33.0	0.1	
Delay (s)		20.4	19.3		22.3	19.6	133.0	10.2		60.9	7.8	
Level of Service		C	B		C	B	F	B		E	A	
Approach Delay (s)		19.8			20.8			13.6			11.2	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	55.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	0	36	8	0	9	13	901	2	1	733	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1690		3433	3538		1770	3533	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1690		3433	3538		1770	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	39	9	0	10	14	979	2	1	797	9
RTOR Reduction (vph)	0	35	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	83	4	0	0	9	0	14	981	0	1	805	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Effective Green, g (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Actuated g/C Ratio	0.11	0.11			0.02		0.01	0.47		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	202	181			30		34	1678		17	1676	
v/s Ratio Prot	c0.05	0.00			c0.01		c0.00	c0.28		0.00	0.23	
v/s Ratio Perm												
v/c Ratio	0.41	0.02			0.31		0.41	0.58		0.06	0.48	
Uniform Delay, d1	20.9	20.0			24.6		25.0	9.7		24.9	9.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			2.1		2.9	0.9		0.5	0.6	
Delay (s)	21.4	20.0			26.7		27.9	10.7		25.4	9.7	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		21.0			26.7			10.9			9.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	19.5
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	6	78	151	30	66	38	674	23	4	718	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1779	1583		1788	1583	3433	3522		1770	3518	
Flt Permitted		0.60	1.00		0.68	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1125	1583		1259	1583	3433	3522		1770	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	7	85	164	33	72	41	733	25	4	780	33
RTOR Reduction (vph)	0	0	68	0	0	58	0	3	0	0	3	0
Lane Group Flow (vph)	0	128	17	0	197	14	41	755	0	4	810	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		10.0	10.0		10.0	10.0	1.2	24.7		0.6	24.1	
Effective Green, g (s)		10.0	10.0		10.0	10.0	1.2	24.7		0.6	24.1	
Actuated g/C Ratio		0.20	0.20		0.20	0.20	0.02	0.49		0.01	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		225	317		252	317	83	1743		21	1699	
v/s Ratio Prot							c0.01	0.21		0.00	c0.23	
v/s Ratio Perm		0.11	0.01		c0.16	0.01						
v/c Ratio		0.57	0.05		0.78	0.05	0.49	0.43		0.19	0.48	
Uniform Delay, d1		18.0	16.1		18.9	16.1	24.1	8.1		24.4	8.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0	0.0		13.5	0.0	1.7	0.5		1.6	0.6	
Delay (s)		20.0	16.2		32.4	16.1	25.7	8.6		26.0	9.2	
Level of Service		B	B		C	B	C	A		C	A	
Approach Delay (s)		18.4			28.1			9.4			9.3	
Approach LOS		B			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	14.6
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
19: Project Access & Ruffin Road

Ex + Entire Proj PM (Year 2030)
1/3/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	101	1033	43	0	941
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	110	1123	47	0	1023
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.87	0.82			0.82	
vC, conflicting volume	1634	561			1170	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	932	29			770	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	87			100	
cM capacity (veh/h)	230	853			690	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	561	561	47	511	511
Volume Left	0	0	0	0	0	0
Volume Right	110	0	0	47	0	0
cSH	853	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.33	0.33	0.03	0.30	0.30
Queue Length 95th (ft)	11	0	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.8	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		41.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
20: Lightwave Avenue & Ruffin Road

Ex + Entire Proj PM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	35	132	106	96	282	164	670	53	170	613	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1654		3433	3500		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1654		3433	3500		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	38	143	115	104	307	178	728	58	185	666	172
RTOR Reduction (vph)	0	0	85	0	105	0	0	5	0	0	0	98
Lane Group Flow (vph)	168	38	58	115	306	0	178	781	0	185	666	74
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	8.1	18.5	27.8	12.8	23.8		9.3	25.8		13.9	30.4	38.5
Effective Green, g (s)	8.1	18.5	27.8	12.8	23.8		9.3	25.8		13.9	30.4	38.5
Actuated g/C Ratio	0.09	0.21	0.31	0.14	0.27		0.10	0.29		0.16	0.34	0.43
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	312	387	494	254	442		358	1013		276	1207	684
v/s Ratio Prot	c0.05	0.02	0.01	0.06	c0.19		0.05	c0.22		c0.10	0.19	0.01
v/s Ratio Perm			0.02									0.04
v/c Ratio	0.54	0.10	0.12	0.45	0.69		0.50	0.77		0.67	0.55	0.11
Uniform Delay, d1	38.7	28.6	21.9	34.9	29.4		37.7	28.9		35.4	23.8	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1	0.1	1.3	4.7		1.1	3.7		6.3	0.5	0.1
Delay (s)	40.5	28.7	22.0	36.2	34.0		38.8	32.6		41.7	24.4	15.1
Level of Service	D	C	C	D	C		D	C		D	C	B
Approach Delay (s)		31.6			34.5			33.8			26.0	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay		30.8	HCM Level of Service	C
HCM Volume to Capacity ratio		0.70		
Actuated Cycle Length (s)		89.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization		71.0%	ICU Level of Service	C
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
21: Spectrum Center Boulevard & Ruffin Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	0	285	16	4	16	103	632	4	15	790	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Flt Permitted	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	310	17	4	17	112	687	4	16	859	30
RTOR Reduction (vph)	0	0	236	0	0	16	0	0	0	0	0	10
Lane Group Flow (vph)	87	0	74	0	21	1	112	691	0	16	859	20
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	3.5		10.9		2.0	2.0	7.4	19.5		0.6	12.7	12.7
Effective Green, g (s)	3.5		10.9		2.0	2.0	7.4	19.5		0.6	12.7	12.7
Actuated g/C Ratio	0.08		0.24		0.04	0.04	0.16	0.43		0.01	0.28	0.28
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	263		378		78	69	556	1509		23	983	440
v/s Ratio Prot	c0.03		0.03		c0.01		c0.03	c0.20		0.01	c0.24	
v/s Ratio Perm			0.01			0.00						0.01
v/c Ratio	0.33		0.20		0.27	0.01	0.20	0.46		0.70	0.87	0.05
Uniform Delay, d1	20.0		13.9		21.1	20.9	16.6	9.3		22.5	15.7	12.1
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7		0.3		1.9	0.1	0.2	0.2		63.9	8.7	0.0
Delay (s)	20.7		14.2		23.0	21.0	16.8	9.6		86.4	24.4	12.1
Level of Service	C		B		C	C	B	A		F	C	B
Approach Delay (s)		15.6			22.1			10.6			25.1	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	45.7	Sum of lost time (s)	25.6
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Entire Proj PM (Year 2030)
22: Balboa Avenue & Ruffin Road

1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	867	141	109	479	233	417	438	351	502	437	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	942	153	118	521	253	453	476	382	546	475	238
RTOR Reduction (vph)	0	18	0	0	0	137	0	0	142	0	0	186
Lane Group Flow (vph)	161	1077	0	118	521	116	453	476	240	546	475	52
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	9.8	29.2		10.6	30.2	46.1	18.4	24.2	24.2	15.9	21.8	21.8
Effective Green, g (s)	9.8	29.2		10.6	30.2	46.1	18.4	24.2	24.2	15.9	21.8	21.8
Actuated g/C Ratio	0.10	0.29		0.11	0.30	0.46	0.18	0.24	0.24	0.16	0.22	0.22
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	173	1448		187	1530	1280	629	853	382	544	768	344
v/s Ratio Prot	c0.09	c0.22		0.07	0.10	0.01	0.13	0.13		c0.16	0.13	
v/s Ratio Perm						0.03			c0.15			0.03
v/c Ratio	0.93	0.74		0.63	0.34	0.09	0.72	0.56	0.63	1.00	0.62	0.15
Uniform Delay, d1	45.0	32.2		43.0	27.3	15.3	38.6	33.4	34.1	42.2	35.5	31.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.5	2.1		6.8	0.1	0.0	4.1	0.8	3.2	39.5	1.5	0.2
Delay (s)	93.5	34.3		49.8	27.5	15.4	42.6	34.2	37.3	81.7	37.0	32.0
Level of Service	F	C		D	C	B	D	C	D	F	D	C
Approach Delay (s)		41.9			27.0			38.0			55.5	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	41.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	15.1
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Entire Proj PM (Year 2030)
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1751	21	47	697	86	24	7	484	474	13	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5076		1770	6303			1794	1583	1770	1615	
Flt Permitted	0.95	1.00		0.95	1.00			0.81	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5076		1770	6303			1501	1583	1369	1615	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	1903	23	51	758	93	26	8	526	515	14	109
RTOR Reduction (vph)	0	1	0	0	18	0	0	0	65	0	65	0
Lane Group Flow (vph)	48	1925	0	51	833	0	0	34	461	515	58	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	6.4	49.2		3.8	47.6			46.2	46.2	46.2	46.2	
Effective Green, g (s)	6.4	49.2		3.8	47.6			46.2	46.2	46.2	46.2	
Actuated g/C Ratio	0.06	0.43		0.03	0.41			0.40	0.40	0.40	0.40	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	98	2160		58	2595			600	633	547	645	
v/s Ratio Prot	0.03	c0.38		c0.03	0.13						0.04	
v/s Ratio Perm								0.02	0.29	c0.38		
v/c Ratio	0.49	0.89		0.88	0.32			0.06	0.73	0.94	0.09	
Uniform Delay, d1	53.0	30.7		55.7	23.0			21.3	29.4	33.4	21.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	5.1		75.1	0.1			0.0	4.2	24.7	0.1	
Delay (s)	56.8	35.8		130.8	23.1			21.4	33.5	58.1	21.7	
Level of Service	E	D		F	C			C	C	E	C	
Approach Delay (s)		36.3			29.2			32.8			51.1	
Approach LOS		D			C			C			D	

Intersection Summary				
HCM Average Control Delay	36.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	104.6%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Entire Proj PM (Year 2030)
1/3/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	81	123	227	27	63	189
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	134	247	29	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	276				571	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	276				571	261
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				85	74
cM capacity (veh/h)	1287				449	777

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	88	134	276	274
Volume Left	88	0	0	68
Volume Right	0	0	29	205
cSH	1287	1700	1700	657
Volume to Capacity	0.07	0.08	0.16	0.42
Queue Length 95th (ft)	6	0	0	51
Control Delay (s)	8.0	0.0	0.0	14.3
Lane LOS	A			B
Approach Delay (s)	3.2		0.0	14.3
Approach LOS				B

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	170	216	16	38	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	185	235	17	41	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	252				463	243
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	252				463	243
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	95
cM capacity (veh/h)	1313				550	795

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	185	252	83
Volume Left	17	0	0	41
Volume Right	0	0	17	41
cSH	1313	1700	1700	650
Volume to Capacity	0.01	0.11	0.15	0.13
Queue Length 95th (ft)	1	0	0	11
Control Delay (s)	7.8	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	0.7		0.0	11.3
Approach LOS				B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

ILV ANALYSIS WORKSHEETS

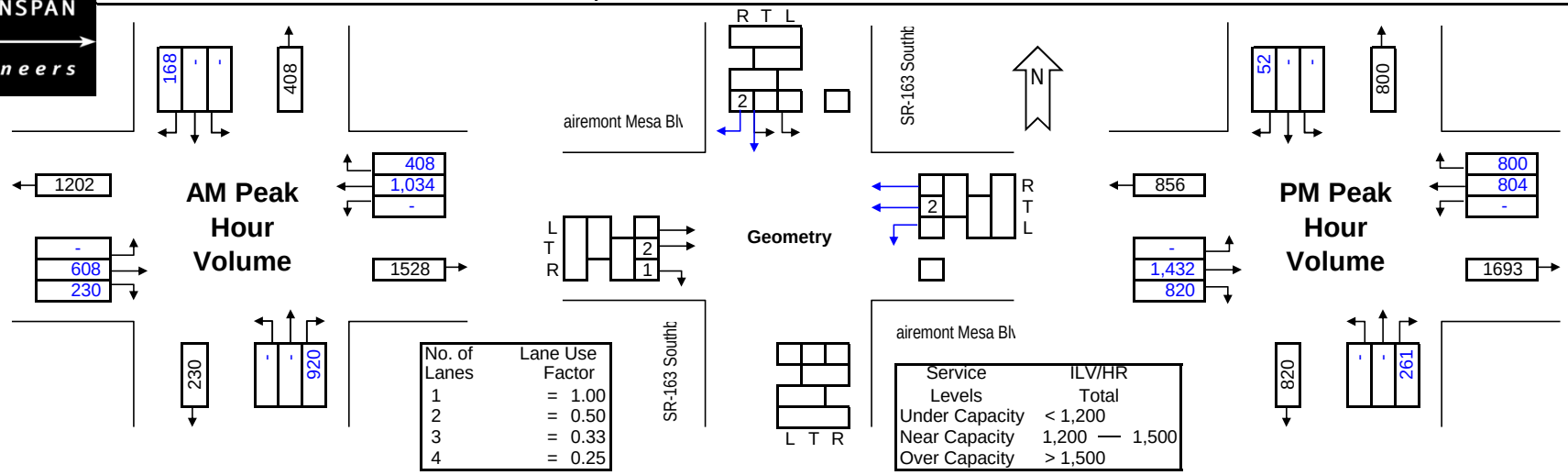
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Entire Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



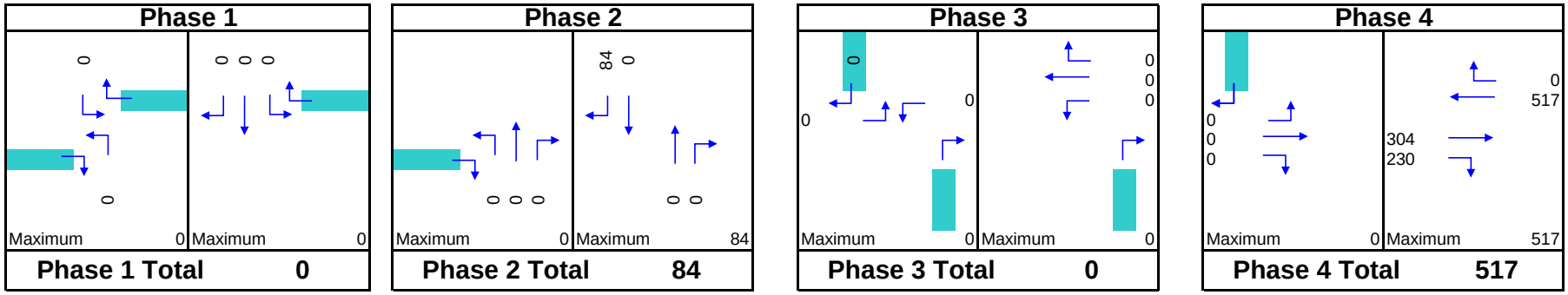
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 601

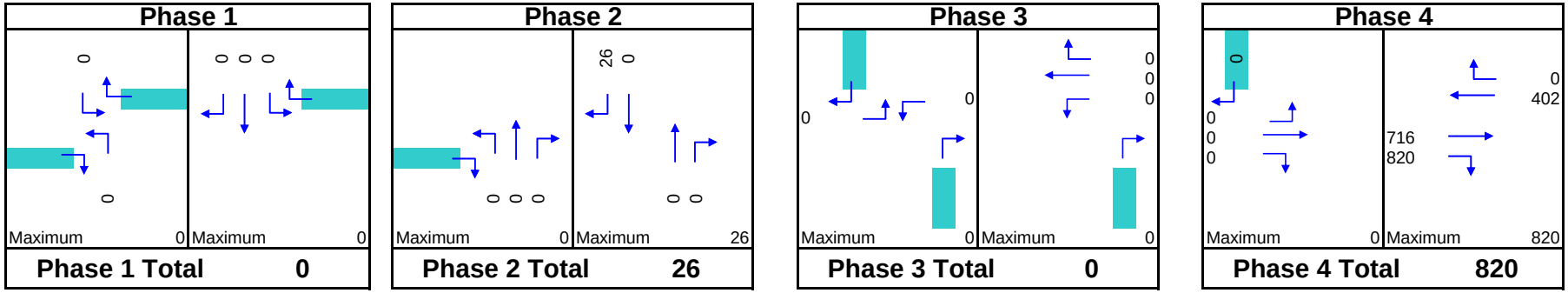
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 846

Service Level: **Under Capacity**



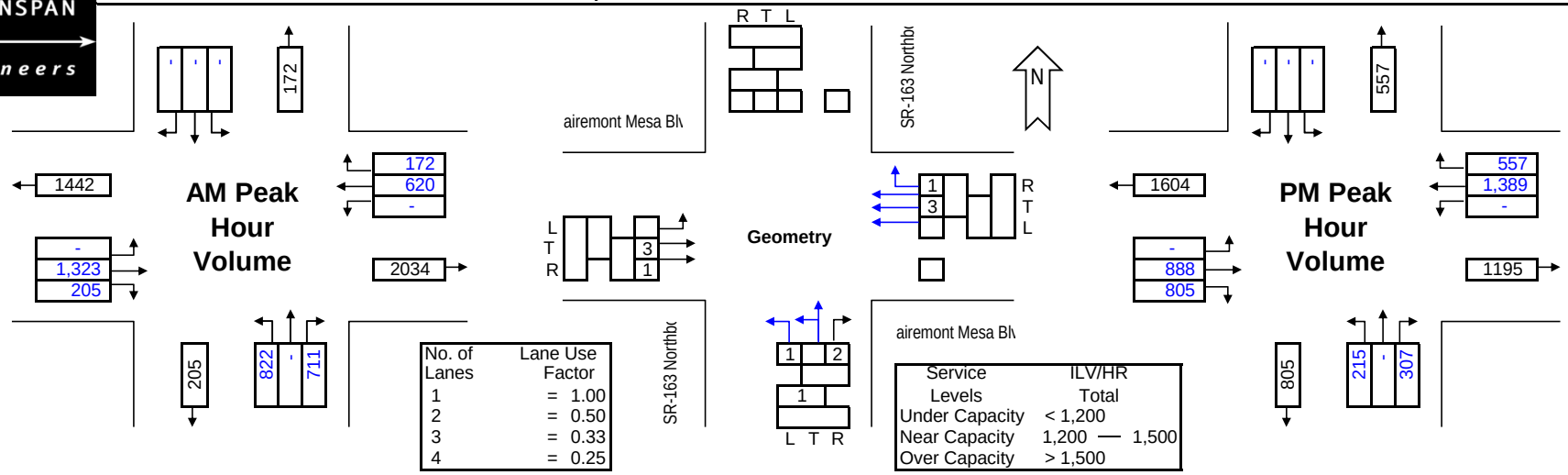
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Entire Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



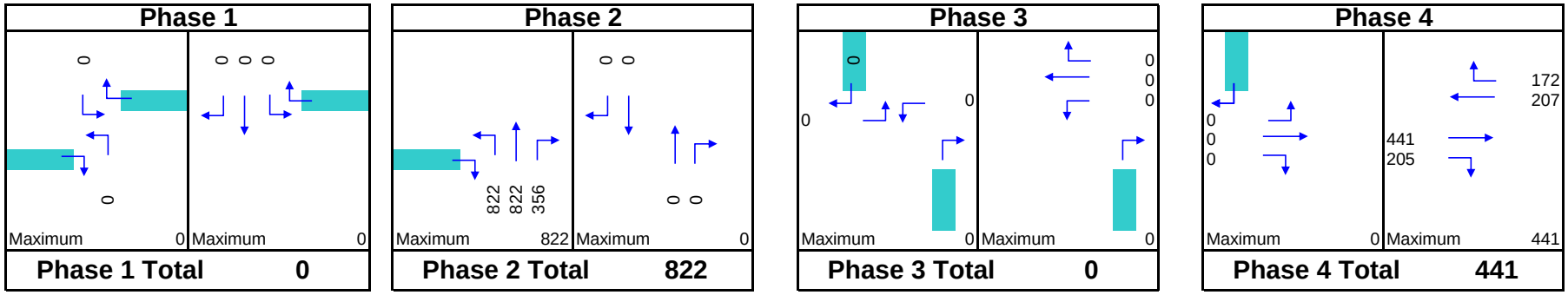
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1263

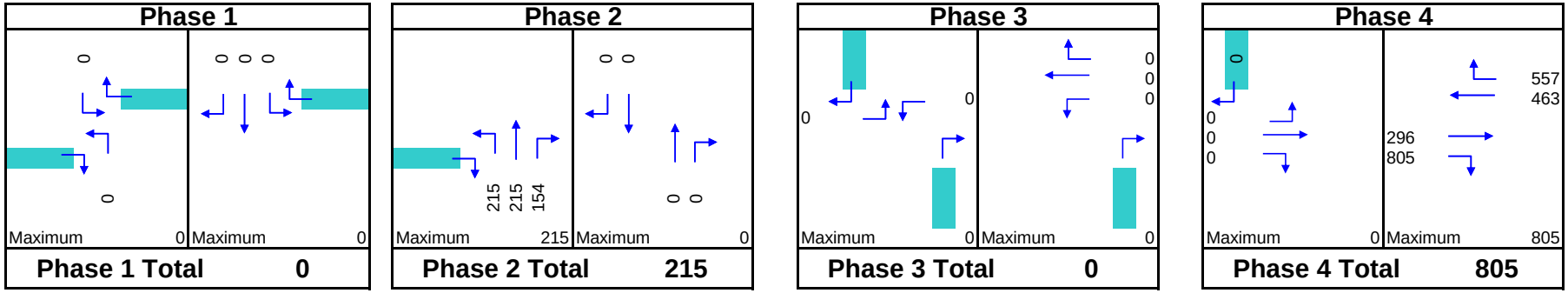
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1020

Service Level: **Under Capacity**



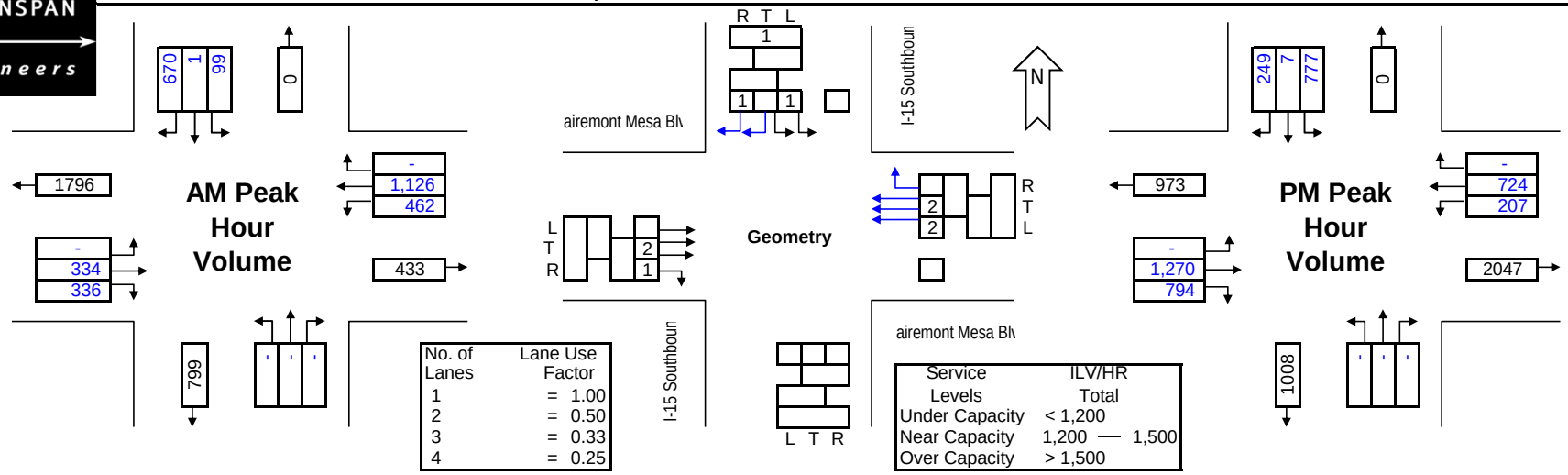
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Entire Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1908 — Service Level: **Over Capacity**

Phase	Maximum	Phase Total
Phase 1	670	670
Phase 2	671	671
Phase 3	231	231
Phase 4	336	336

PM Peak Hour Analysis

Total Crictical Lane Volume 1931 — Service Level: **Over Capacity**

Phase	Maximum	Phase Total
Phase 1	777	777
Phase 2	256	256
Phase 3	104	104
Phase 4	794	794

LINSCOTT LAW & GREENSPAN engineers

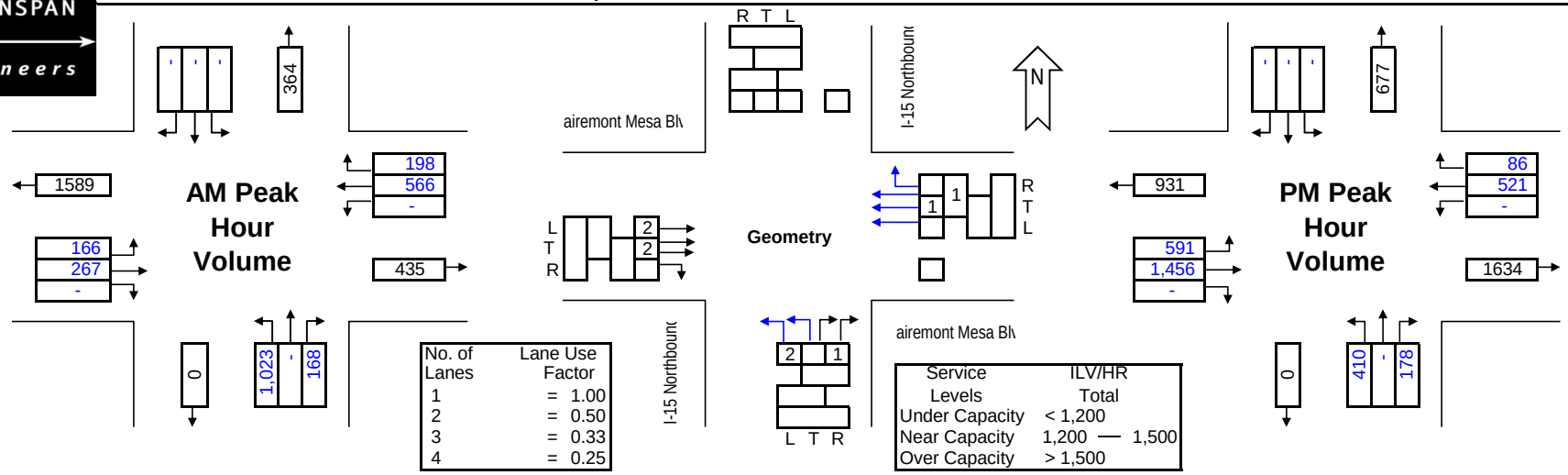
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Entire Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



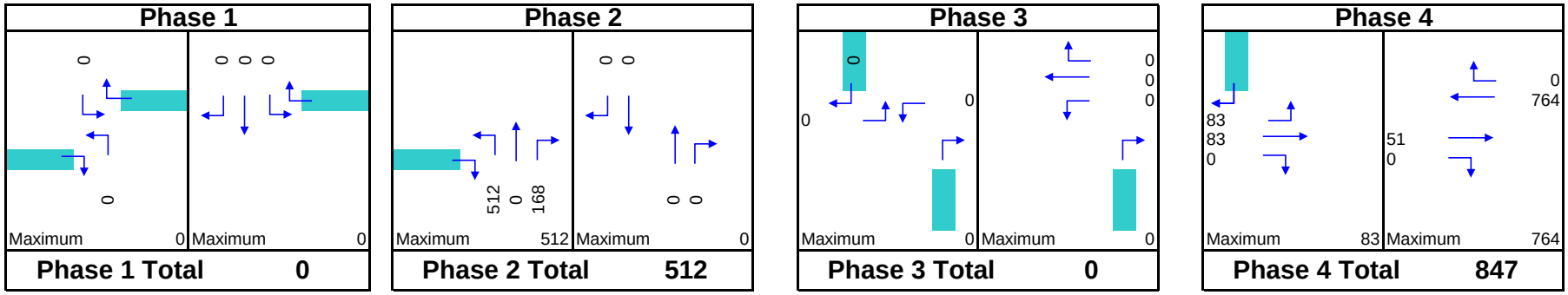
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1359

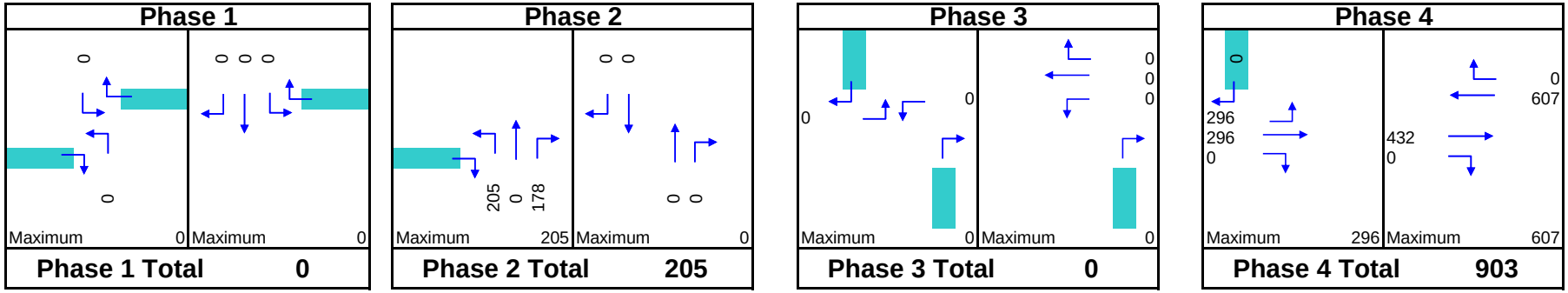
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1108

Service Level: **Under Capacity**



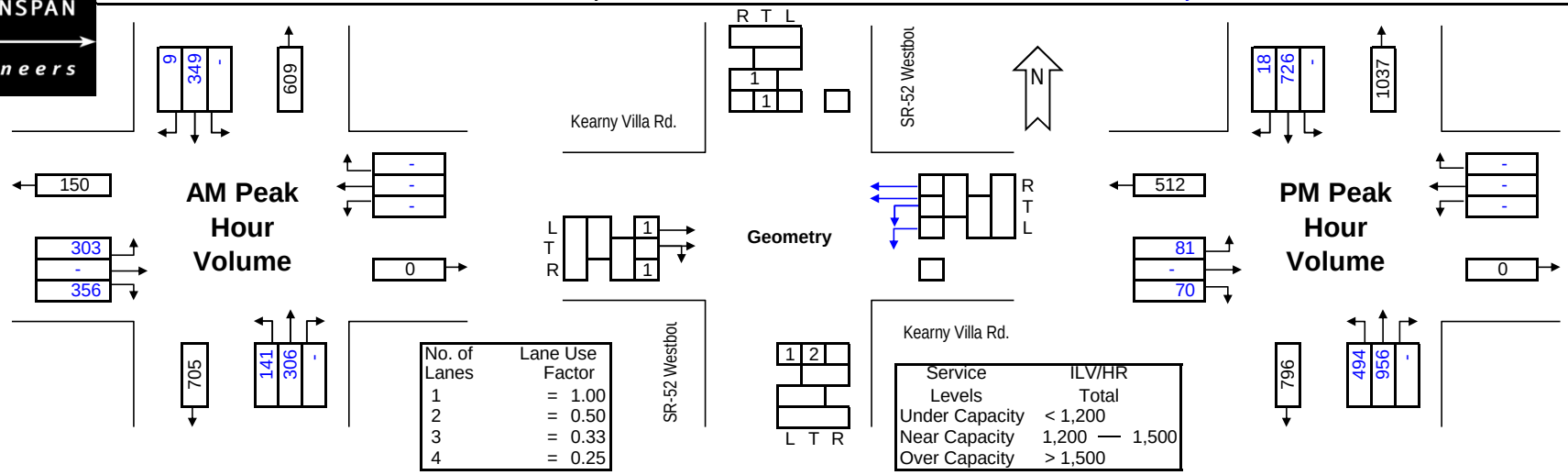
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Entire Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps N/S
at Kearny Villa Rd. E/W



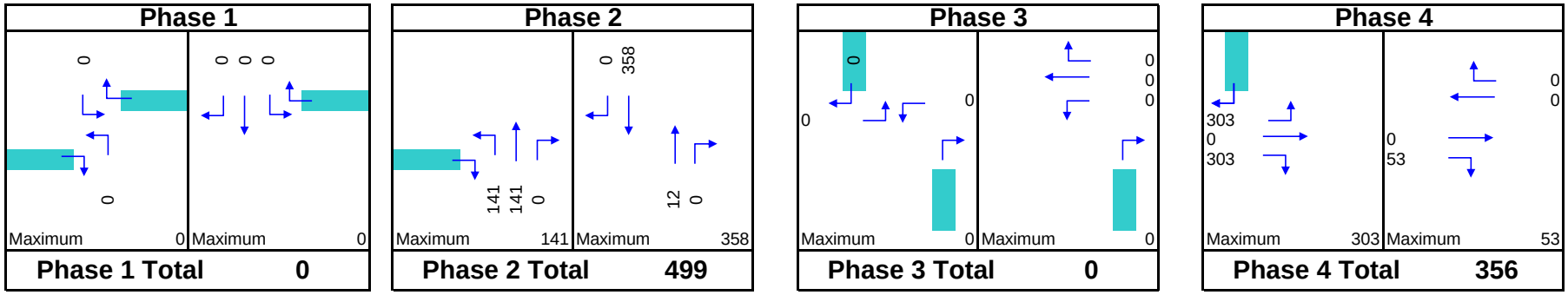
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 855

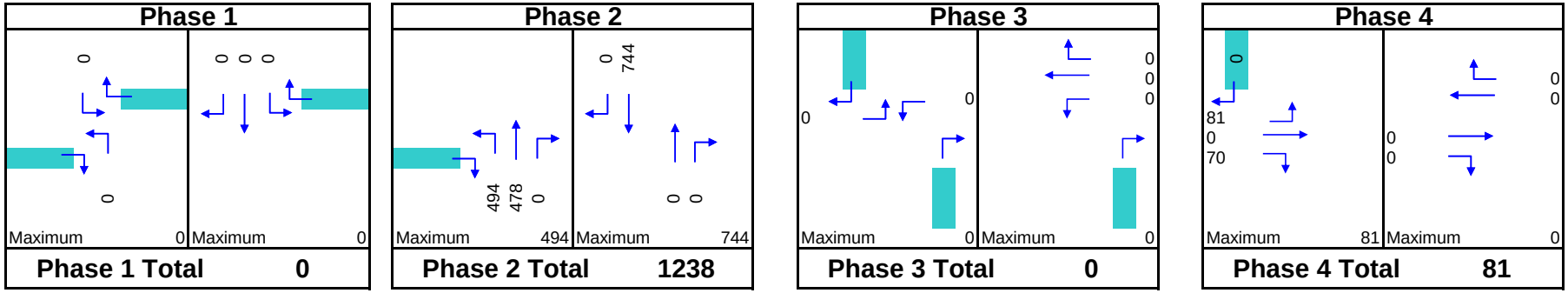
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1319

Service Level: **Near Capacity**



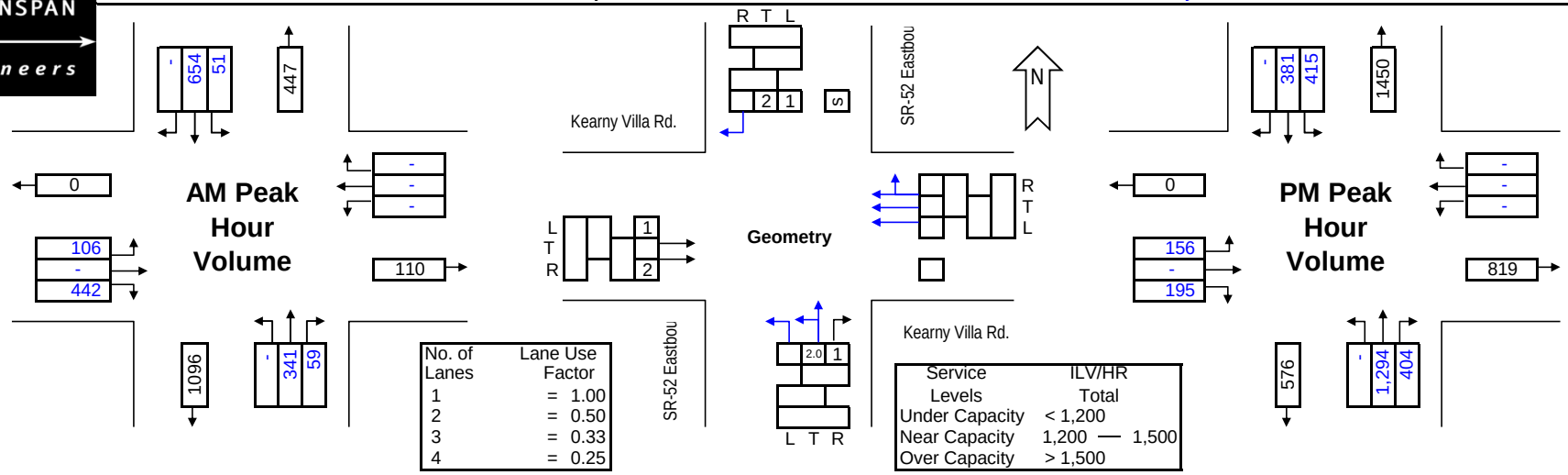
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Entire Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps N/S
at Kearny Villa Rd. E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 719 — Service Level: **Under Capacity**

Phase	Maximum	Phase Total
Phase 1	0 / 51	51
Phase 2	171 / 276	447
Phase 3	0 / 0	0
Phase 4	106 / 115	221

PM Peak Hour Analysis

Total Crictical Lane Volume 1218 — Service Level: **Near Capacity**

Phase	Maximum	Phase Total
Phase 1	0 / 415	415
Phase 2	647 / 0	647
Phase 3	0 / 0	0
Phase 4	156 / 0	156

Table X
Existing + Entire Project ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	601	Under Capacity
	PM	846	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,263	Near Capacity
	PM	1,020	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	1,908	Over Capacity
	PM	1,931	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,359	Near Capacity
	PM	1,108	Under Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	855	Under Capacity
	PM	1,319	Near Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	719	Under Capacity
	PM	1,218	Near Capacity

APPENDIX F

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS - NEAR TERM (WITHOUT PROJECT)

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	709	23	275	1569	199	22	10	172	123	13	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.87	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5000		1770	1533	1504	3433	3166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5000		1770	1533	1504	3433	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	771	25	299	1705	216	24	11	187	134	14	33
RTOR Reduction (vph)	0	0	9	0	10	0	0	85	78	0	29	0
Lane Group Flow (vph)	35	771	16	299	1911	0	24	16	19	134	18	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	2.8	57.3	69.5	15.6	69.5		5.6	6.5	22.1	11.4	12.6	
Effective Green, g (s)	2.8	57.3	69.5	15.6	69.5		5.6	6.5	22.1	11.4	12.6	
Actuated g/C Ratio	0.03	0.52	0.63	0.14	0.63		0.05	0.06	0.20	0.10	0.11	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	45	2649	1000	487	3159		90	91	362	356	363	
v/s Ratio Prot	0.02	0.15		c0.09	c0.38		0.01	c0.01	0.01	c0.04	0.01	
v/s Ratio Perm			0.01						0.01			
v/c Ratio	0.78	0.29	0.02	0.61	0.60		0.27	0.18	0.05	0.38	0.05	
Uniform Delay, d1	53.3	14.9	7.5	44.4	12.1		50.2	49.2	35.5	46.0	43.4	
Progression Factor	1.00	1.00	1.00	0.92	0.64		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	53.1	0.3	0.0	1.6	0.4		0.6	0.3	0.0	0.2	0.0	
Delay (s)	106.3	15.2	7.5	42.6	8.0		50.8	49.6	35.5	46.2	43.4	
Level of Service	F	B	A	D	A		D	D	D	D	D	
Approach Delay (s)		18.8			12.7			43.6			45.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	17.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.8	
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	774	230	0	1060	434	0	0	1154	0	0	168
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	841	250	0	1152	472	0	0	1254	0	0	183
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.96			0.91			0.93	0.93	0.91	0.93	0.93	0.96
vC, conflicting volume	1624			1091			1600	2465	421	2827	2243	576
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1573			906			1320	2251	171	2640	2012	486
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	64
cM capacity (veh/h)	400			680			68	38	769	0	54	508

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	421	421	250	576	576	472	1254	91	91
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	250	0	0	472	1254	91	91
cSH	1700	1700	1700	1700	1700	1700	769	508	508
Volume to Capacity	0.25	0.25	0.15	0.34	0.34	0.28	1.63	0.18	0.18
Queue Length 95th (ft)	0	0	0	0	0	0	1692	16	16
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	305.7	13.6	13.6
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			305.7	13.6	
Approach LOS							F	B	

Intersection Summary			
Average Delay	92.9		
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1720	205	0	605	203	822	0	892	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1870	223	0	658	221	893	0	970	0	0	0
RTOR Reduction (vph)	0	0	117	0	0	116	0	0	4	0	0	0
Lane Group Flow (vph)	0	1870	106	0	658	105	446	447	966	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		52.1	52.1		52.1	52.1	47.1	47.1	47.1			
Effective Green, g (s)		52.1	52.1		52.1	52.1	47.1	47.1	47.1			
Actuated g/C Ratio		0.47	0.47		0.47	0.47	0.43	0.43	0.43			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2408	750		2408	750	720	720	1193			
v/s Ratio Prot		c0.37			0.13		0.27	0.27	c0.35			
v/s Ratio Perm			0.07			0.07						
v/c Ratio		0.78	0.14		0.27	0.14	0.62	0.62	0.81			
Uniform Delay, d1		24.1	16.3		17.5	16.3	24.5	24.5	27.5			
Progression Factor		0.87	0.36		0.58	0.70	1.00	1.00	1.00			
Incremental Delay, d2		2.5	0.4		0.3	0.4	1.6	1.7	4.2			
Delay (s)		23.6	6.3		10.5	11.9	26.1	26.2	31.7			
Level of Service		C	A		B	B	C	C	C			
Approach Delay (s)		21.7			10.8			29.0			0.0	
Approach LOS		C			B			C			A	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
4: Clairemont Mesa Boulevard & Kearny Villa Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	1414	1037	146	599	12	146	81	132	39	89	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	1537	1127	159	651	13	159	88	143	42	97	150
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	61	0	0	63
Lane Group Flow (vph)	177	1537	1127	159	651	2	159	88	82	42	97	87
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	4.0	62.9	110.0	4.8	63.6	17.5	12.2	17.5	62.9	5.6	11.1	63.6
Effective Green, g (s)	4.0	62.9	110.0	4.8	63.6	17.5	12.2	17.5	62.9	5.6	11.1	63.6
Actuated g/C Ratio	0.04	0.57	1.00	0.04	0.58	0.16	0.11	0.16	0.57	0.05	0.10	0.58
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	2908	1583	77	2940	252	381	296	905	90	188	915
v/s Ratio Prot	0.05	0.30		c0.09	0.13		0.05	0.05		0.02	0.05	
v/s Ratio Perm			c0.71			0.00			0.05			0.05
v/c Ratio	1.42	0.53	0.71	2.06	0.22	0.01	0.42	0.30	0.09	0.47	0.52	0.09
Uniform Delay, d1	53.0	14.5	0.0	52.6	11.2	38.9	45.6	40.8	10.6	50.7	46.9	10.4
Progression Factor	0.90	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	213.1	0.4	1.7	520.9	0.2	0.0	0.7	0.6	0.2	3.8	2.4	0.2
Delay (s)	260.8	9.3	1.7	573.5	11.4	39.0	46.3	41.4	10.8	54.5	49.3	10.6
Level of Service	F	A	A	F	B	D	D	D	B	D	D	B
Approach Delay (s)		22.0			120.4			32.2			29.9	
Approach LOS		C			F			C			C	

Intersection Summary				
HCM Average Control Delay	42.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	1083	100	68	660	95	45	4	83	51	1	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	5021		1770	4989			1780	1583		1776	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.69	1.00
Satd. Flow (perm)	1770	5021		1770	4989			1307	1583		1287	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	241	1177	109	74	717	103	49	4	90	55	1	37
RTOR Reduction (vph)	0	9	0	0	16	0	0	0	81	0	0	33
Lane Group Flow (vph)	241	1277	0	74	804	0	0	53	9	0	56	4
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	16.0	51.9		7.5	43.4			7.6	7.6		7.6	7.6
Effective Green, g (s)	16.0	51.9		7.5	43.4			7.6	7.6		7.6	7.6
Actuated g/C Ratio	0.20	0.66		0.09	0.55			0.10	0.10		0.10	0.10
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	358	3299		168	2741			126	152		124	152
v/s Ratio Prot	c0.14	c0.25		0.04	0.16							
v/s Ratio Perm								0.04	0.01		c0.04	0.00
v/c Ratio	0.67	0.39		0.44	0.29			0.42	0.06		0.45	0.02
Uniform Delay, d1	29.1	6.2		33.8	9.6			33.6	32.4		33.7	32.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.9	0.3		1.8	0.3			2.3	0.2		2.6	0.1
Delay (s)	34.0	6.6		35.6	9.8			35.9	32.6		36.3	32.4
Level of Service	C	A		D	A			D	C		D	C
Approach Delay (s)		10.9			12.0			33.8			34.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	720	281	162	639	63	146	169	76	31	28	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4871		3433	5085	1583	1770	3374		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4871		3433	5085	1583	1770	3374		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	323	783	305	176	695	68	159	184	83	34	30	66
RTOR Reduction (vph)	0	64	0	0	0	52	0	45	0	0	0	44
Lane Group Flow (vph)	323	1024	0	176	695	16	159	222	0	34	30	22
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	13.6	31.0		8.8	26.1	26.1	15.5	47.7		3.8	36.0	36.0
Effective Green, g (s)	13.6	31.0		8.8	26.1	26.1	15.5	47.7		3.8	36.0	36.0
Actuated g/C Ratio	0.12	0.28		0.08	0.24	0.24	0.14	0.43		0.03	0.33	0.33
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	424	1373		275	1207	376	249	1463		61	610	518
v/s Ratio Prot	0.09	c0.21		0.05	c0.14		c0.09	c0.07		c0.02	0.02	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.76	0.75		0.64	0.58	0.04	0.64	0.15		0.56	0.05	0.04
Uniform Delay, d1	46.6	35.9		49.1	37.1	32.3	44.6	18.9		52.3	25.3	25.2
Progression Factor	1.00	1.00		0.79	0.46	0.22	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.9	3.7		4.1	1.6	0.2	5.3	0.0		10.6	0.2	0.2
Delay (s)	54.5	39.6		43.0	18.6	7.3	49.9	18.9		62.9	25.5	25.4
Level of Service	D	D		D	B	A	D	B		E	C	C
Approach Delay (s)		43.1			22.4			30.5			35.2	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	355	312	135	452	670	358	89	226	69	155	447	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4855		3433	4820		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4855		3433	4820		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	339	147	491	728	389	97	246	75	168	486	153
RTOR Reduction (vph)	0	72	0	0	87	0	0	0	53	0	0	105
Lane Group Flow (vph)	386	414	0	491	1030	0	97	246	23	168	486	48
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	15.2	34.1		16.7	35.7		7.0	33.0	33.0	6.6	32.8	32.8
Effective Green, g (s)	15.2	34.1		16.7	35.7		7.0	33.0	33.0	6.6	32.8	32.8
Actuated g/C Ratio	0.14	0.31		0.15	0.32		0.06	0.30	0.30	0.06	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	474	1505		521	1564		218	1062	475	206	1055	472
v/s Ratio Prot	c0.11	0.09		c0.14	c0.21		0.03	0.07		c0.05	c0.14	
v/s Ratio Perm									0.01			0.03
v/c Ratio	0.81	0.28		0.94	0.66		0.44	0.23	0.05	0.82	0.46	0.10
Uniform Delay, d1	46.0	28.6		46.2	31.9		49.6	29.0	27.3	51.1	31.4	27.9
Progression Factor	0.54	0.14		0.84	0.77		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.9	0.3		25.2	2.1		1.4	0.5	0.2	21.4	1.4	0.4
Delay (s)	32.9	4.2		64.0	26.6		51.1	29.5	27.5	72.5	32.9	28.4
Level of Service	C	A		E	C		D	C	C	E	C	C
Approach Delay (s)		16.9			38.0			34.1			40.3	
Approach LOS		B			D			C			D	

Intersection Summary				
HCM Average Control Delay	33.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	23.7	
Intersection Capacity Utilization	62.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	628	148	0	1209	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4		5.1		4.4
Lane Util. Factor	0.91	1.00		0.91		0.88
Frt	1.00	0.85		1.00		0.85
Flt Protected	1.00	1.00		1.00		1.00
Satd. Flow (prot)	5085	1583		5085		2787
Flt Permitted	1.00	1.00		1.00		1.00
Satd. Flow (perm)	5085	1583		5085		2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	683	161	0	1314	0	2
RTOR Reduction (vph)	0	150	0	0	0	2
Lane Group Flow (vph)	683	11	0	1314	0	0
Turn Type		custom	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		4				3
Actuated Green, G (s)	83.0	7.5		83.1		5.5
Effective Green, g (s)	83.0	7.5		83.1		5.5
Actuated g/C Ratio	0.75	0.07		0.76		0.05
Clearance Time (s)	5.2	4.4		5.1		4.4
Vehicle Extension (s)	3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	3837	108		3841		139
v/s Ratio Prot	0.13			c0.26		
v/s Ratio Perm		c0.01				c0.00
v/c Ratio	0.18	0.10		0.34		0.00
Uniform Delay, d1	3.8	48.1		4.4		49.6
Progression Factor	0.76	2.73		0.61		1.00
Incremental Delay, d2	0.1	0.4		0.2		0.0
Delay (s)	3.0	131.7		2.9		49.6
Level of Service	A	F		A		D
Approach Delay (s)	27.6			2.9	49.6	
Approach LOS	C			A	D	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	481	137	382	1250	160	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	523	149	415	1359	174	76
RTOR Reduction (vph)	0	0	49	0	0	0	25
Lane Group Flow (vph)	0	523	100	415	1359	174	51
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		47.5	47.5	30.9	83.4	16.2	47.1
Effective Green, g (s)		47.5	47.5	30.9	83.4	16.2	47.1
Actuated g/C Ratio		0.43	0.43	0.28	0.76	0.15	0.43
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1528	684	497	3855	261	678
v/s Ratio Prot		0.15		c0.23	c0.27	c0.10	0.02
v/s Ratio Perm			0.06				0.01
v/c Ratio		0.34	0.15	0.84	0.35	0.67	0.08
Uniform Delay, d1		20.8	19.0	37.2	4.4	44.3	18.6
Progression Factor		0.45	0.10	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.6	0.4	11.5	0.3	6.3	0.0
Delay (s)		9.9	2.4	48.7	4.6	50.6	18.6
Level of Service		A	A	D	A	D	B
Approach Delay (s)		8.3			15.0	40.9	
Approach LOS		A			B	D	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.7
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	311	242	462	991	0	0	0	0	99	1	641
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1447	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1447	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	338	263	502	1077	0	0	0	0	108	1	697
RTOR Reduction (vph)	0	0	184	0	0	0	0	0	0	0	46	46
Lane Group Flow (vph)	0	338	79	502	1077	0	0	0	0	97	308	309
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		24.9	29.9	33.2	62.1					29.9	29.9	29.9
Effective Green, g (s)		24.9	29.9	33.2	62.1					29.9	29.9	29.9
Actuated g/C Ratio		0.25	0.30	0.33	0.62					0.30	0.30	0.30
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		881	833	1140	2198					503	433	450
v/s Ratio Prot		0.10		0.15	c0.30					0.06	c0.21	
v/s Ratio Perm			0.03									0.21
v/c Ratio		0.38	0.09	0.44	0.49					0.19	0.71	0.69
Uniform Delay, d1		31.2	25.3	26.1	10.3					26.1	31.2	30.9
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.0	0.3	0.8					0.2	5.5	4.3
Delay (s)		31.5	25.3	26.4	11.1					26.3	36.7	35.3
Level of Service		C	C	C	B					C	D	D
Approach Delay (s)		28.8			16.0			0.0			34.8	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	271	0	0	591	198	1017	0	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3406		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3406		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	295	0	0	642	215	1105	0	183	0	0	0
RTOR Reduction (vph)	0	0	0	0	39	0	0	0	113	0	0	0
Lane Group Flow (vph)	158	295	0	0	818	0	1105	0	70	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	6.8	39.3			28.3		30.7		30.7			
Effective Green, g (s)	6.8	39.3			28.3		30.7		30.7			
Actuated g/C Ratio	0.08	0.49			0.35		0.38		0.38			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	292	1739			1205		1317		607			
v/s Ratio Prot	c0.05	0.08			c0.24		c0.32					
v/s Ratio Perm									0.04			
v/c Ratio	0.54	0.17			0.68		0.84		0.12			
Uniform Delay, d1	35.1	11.3			22.0		22.4		15.9			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	2.0	0.2			3.1		4.9		0.1			
Delay (s)	37.1	11.5			25.1		27.3		16.0			
Level of Service	D	B			C		C		B			
Approach Delay (s)		20.4			25.1			25.7			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
12: Lightwave Avenue & Overland Avenue

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	127	52	104	202	240	50	128	35	131	304	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.92		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3384		1770	3251		1770	3425		1770	3407	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3384		1770	3251		1770	3425		1770	3407	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	138	57	113	220	261	54	139	38	142	330	109
RTOR Reduction (vph)	0	45	0	0	206	0	0	28	0	0	34	0
Lane Group Flow (vph)	111	150	0	113	275	0	54	149	0	142	405	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.6	11.8		6.6	11.8		3.7	9.9		9.5	15.7	
Effective Green, g (s)	6.6	11.8		6.6	11.8		3.7	9.9		9.5	15.7	
Actuated g/C Ratio	0.12	0.21		0.12	0.21		0.07	0.18		0.17	0.28	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	207	708		207	680		116	601		298	948	
v/s Ratio Prot	0.06	0.04		c0.06	c0.08		c0.03	0.04		0.08	c0.12	
v/s Ratio Perm												
v/c Ratio	0.54	0.21		0.55	0.40		0.47	0.25		0.48	0.43	
Uniform Delay, d1	23.5	18.5		23.5	19.3		25.4	20.0		21.2	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.2		1.6	0.4		1.1	0.2		0.4	0.3	
Delay (s)	24.8	18.6		25.1	19.7		26.5	20.3		21.6	17.0	
Level of Service	C	B		C	B		C	C		C	B	
Approach Delay (s)		20.9			20.7			21.7			18.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	18.6
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	303	347	133	336	446	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3528	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	377	145	365	485	10
RTOR Reduction (vph)	0	222	0	0	1	0
Lane Group Flow (vph)	329	155	145	365	494	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.4	20.4	11.5	48.3	32.6	
Effective Green, g (s)	20.4	20.4	11.5	48.3	32.6	
Actuated g/C Ratio	0.25	0.25	0.14	0.60	0.41	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	451	404	254	2137	1438	
v/s Ratio Prot	c0.19		c0.08	0.10	c0.14	
v/s Ratio Perm		0.10				
v/c Ratio	0.73	0.38	0.57	0.17	0.34	
Uniform Delay, d1	27.3	24.6	31.9	7.0	16.3	
Progression Factor	1.00	1.00	0.79	0.89	1.00	
Incremental Delay, d2	5.8	0.6	3.0	0.2	0.7	
Delay (s)	33.1	25.2	28.4	6.4	17.0	
Level of Service	C	C	C	A	B	
Approach Delay (s)	28.9			12.6	17.0	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	0	525	0	0	0	0	363	53	51	733	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	0	571	0	0	0	0	395	58	55	797	0
RTOR Reduction (vph)	0	0	176	0	0	0	0	0	28	0	0	0
Lane Group Flow (vph)	0	115	395	0	0	0	0	395	30	55	797	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		17.7	17.7					41.3	41.3	5.5	51.0	
Effective Green, g (s)		17.7	17.7					41.3	41.3	5.5	51.0	
Actuated g/C Ratio		0.22	0.22					0.52	0.52	0.07	0.64	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		392	617					1827	817	122	2256	
v/s Ratio Prot								0.11		0.03	c0.23	
v/s Ratio Perm		0.06	c0.14						0.02			
v/c Ratio		0.29	0.64					0.22	0.04	0.45	0.35	
Uniform Delay, d1		25.9	28.3					10.5	9.5	35.8	6.8	
Progression Factor		1.00	1.00					1.00	1.00	0.88	0.48	
Incremental Delay, d2		0.4	2.3					0.3	0.1	2.4	0.4	
Delay (s)		26.4	30.5					10.8	9.6	34.0	3.7	
Level of Service		C	C					B	A	C	A	
Approach Delay (s)		29.8			0.0			10.7			5.6	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
15: Kearny Villa Road & Ruffin Road
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	73	47	6	3	9	18	276	49	76	930	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.98		1.00	0.97	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1744	1583	1770	1648		1770	3460		3433	3426	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1744	1583	1770	1648		1770	3460		3433	3426	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	79	51	7	3	10	20	300	53	83	1011	275
RTOR Reduction (vph)	0	0	44	0	10	0	0	17	0	0	28	0
Lane Group Flow (vph)	108	111	7	7	3	0	20	336	0	83	1258	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.7	7.7	7.7	1.0	1.0		1.0	28.8		2.5	30.3	
Effective Green, g (s)	7.7	7.7	7.7	1.0	1.0		1.0	28.8		2.5	30.3	
Actuated g/C Ratio	0.14	0.14	0.14	0.02	0.02		0.02	0.51		0.04	0.54	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	240	218	32	29		32	1779		153	1854	
v/s Ratio Prot	c0.06	0.06		c0.00	0.00		0.01	0.10		c0.02	c0.37	
v/s Ratio Perm			0.00									
v/c Ratio	0.47	0.46	0.03	0.22	0.11		0.62	0.19		0.54	0.68	
Uniform Delay, d1	22.3	22.2	20.9	27.1	27.1		27.3	7.3		26.2	9.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	1.4	0.1	3.4	1.7		32.4	0.1		3.9	1.0	
Delay (s)	23.8	23.7	21.0	30.5	28.7		59.7	7.4		30.1	10.3	
Level of Service	C	C	C	C	C		E	A		C	B	
Approach Delay (s)		23.2			29.4			10.2			11.5	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	13.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
16: Chesapeake Drive & Ruffin Road
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	38	33	29	37	63	105	276	28	98	884	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1833	1583		1822	1583	1770	3491		1770	3483	
Flt Permitted		0.86	1.00		0.83	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607	1583		1542	1583	1770	3491		1770	3483	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	41	36	32	40	68	114	300	30	107	961	114
RTOR Reduction (vph)	0	0	33	0	0	61	0	6	0	0	8	0
Lane Group Flow (vph)	0	61	3	0	72	7	114	324	0	107	1067	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		5.0	5.0		5.6	5.6	5.7	27.4		6.0	27.7	
Effective Green, g (s)		5.0	5.0		5.6	5.6	5.7	27.4		6.0	27.7	
Actuated g/C Ratio		0.09	0.09		0.10	0.10	0.11	0.51		0.11	0.52	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		150	148		161	165	188	1785		198	1800	
v/s Ratio Prot							c0.06	0.09		0.06	c0.31	
v/s Ratio Perm		0.04	0.00		c0.05	0.00						
v/c Ratio		0.41	0.02		0.45	0.04	0.61	0.18		0.54	0.59	
Uniform Delay, d1		22.9	22.1		22.5	21.6	22.9	7.1		22.5	9.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0		0.7	0.0	3.8	0.1		1.6	0.7	
Delay (s)		23.6	22.1		23.3	21.6	26.6	7.1		24.1	9.7	
Level of Service		C	C		C	C	C	A		C	A	
Approach Delay (s)		23.0			22.5			12.1			11.0	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	12.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
17: Hazard Way & Ruffin Road
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	21	2	0	0	41	343	5	6	744	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3532		1770	3493	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3532		1770	3493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	23	2	0	0	45	373	5	7	809	78
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	24	1	0	0	2	0	45	378	0	7	882	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.2	3.2			0.8		2.7	34.2		0.5	32.0	
Effective Green, g (s)	3.2	3.2			0.8		2.7	34.2		0.5	32.0	
Actuated g/C Ratio	0.05	0.05			0.01		0.05	0.59		0.01	0.55	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	97	87			24		159	2076		15	1921	
v/s Ratio Prot	c0.01	0.00			c0.00		c0.01	0.11		0.00	c0.25	
v/s Ratio Perm												
v/c Ratio	0.25	0.01			0.08		0.28	0.18		0.47	0.46	
Uniform Delay, d1	26.3	26.0			28.3		26.8	5.5		28.7	7.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			0.5		0.4	0.1		8.1	0.5	
Delay (s)	26.8	26.0			28.9		27.2	5.7		36.8	8.3	
Level of Service	C	C			C		C	A		D	A	
Approach Delay (s)		26.4			28.9			7.9			8.6	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	9.0	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	58.2	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	37.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml (Near-Term) AM
18: Farnham St & Ruffin Road
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	11	21	23	13	7	200	653	82	34	625	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799	1583		1805	1583	3433	3480		1770	3462	
Flt Permitted		0.93	1.00		0.89	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1726	1583		1652	1583	3433	3480		1770	3462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	12	23	25	14	8	217	710	89	37	679	116
RTOR Reduction (vph)	0	0	21	0	0	7	0	8	0	0	14	0
Lane Group Flow (vph)	0	42	2	0	39	1	217	791	0	37	781	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		3.7	3.7		3.7	3.7	6.7	28.2		1.4	22.9	
Effective Green, g (s)		3.7	3.7		3.7	3.7	6.7	28.2		1.4	22.9	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.14	0.59		0.03	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		133	122		128	122	480	2049		52	1655	
v/s Ratio Prot							c0.06	0.23		0.02	c0.23	
v/s Ratio Perm		c0.02	0.00		0.02	0.00						
v/c Ratio		0.32	0.01		0.30	0.01	0.45	0.39		0.71	0.47	
Uniform Delay, d1		20.9	20.4		20.9	20.4	18.9	5.2		23.0	8.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		0.5	0.0	0.2	0.3		31.6	0.6	
Delay (s)		21.4	20.4		21.4	20.4	19.2	5.6		54.6	9.0	
Level of Service		C	C		C	C	B	A		D	A	
Approach Delay (s)		21.1			21.2			8.5			11.0	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM Average Control Delay	10.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	47.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	416	137	0	1020
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	452	149	0	1109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.90	0.99			0.99	
vC, conflicting volume	1007	226			601	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	745	203			581	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	315	797			981	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	226	226	149	554	554
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	149	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.13	0.13	0.09	0.33	0.33
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0			0.0	
Approach LOS	A					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	59	110	40	79	97	317	369	0	204	594	323
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1709		3433	3539		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1709		3433	3539		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	64	120	43	86	105	345	401	0	222	646	351
RTOR Reduction (vph)	0	0	65	0	47	0	0	0	0	0	0	215
Lane Group Flow (vph)	103	64	55	43	144	0	345	401	0	222	646	136
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	7.9	17.7	30.4	3.2	13.6		12.7	17.7		14.7	19.7	27.6
Effective Green, g (s)	7.9	17.7	30.4	3.2	13.6		12.7	17.7		14.7	19.7	27.6
Actuated g/C Ratio	0.11	0.25	0.43	0.04	0.19		0.18	0.25		0.21	0.28	0.39
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	380	462	674	79	326		611	877		364	976	612
v/s Ratio Prot	c0.03	0.03	0.01	c0.02	c0.08		c0.10	0.11		0.13	c0.18	0.02
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.27	0.14	0.08	0.54	0.44		0.56	0.46		0.61	0.66	0.22
Uniform Delay, d1	29.1	20.9	12.2	33.4	25.5		26.8	22.8		25.7	22.9	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.1	7.5	1.0		1.2	0.4		2.9	1.7	0.2
Delay (s)	29.5	21.0	12.2	40.8	26.5		28.0	23.2		28.6	24.6	14.9
Level of Service	C	C	B	D	C		C	C		C	C	B
Approach Delay (s)		20.4			29.1			25.4			22.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	17.5	
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	3	143	9	0	5	499	733	40	12	479	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3512		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3512		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	3	155	10	0	5	542	797	43	13	521	182
RTOR Reduction (vph)	0	0	92	0	0	5	0	2	0	0	0	125
Lane Group Flow (vph)	59	3	63	0	10	0	542	838	0	13	521	57
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	3.6	3.6	25.4		1.0	1.0	21.8	37.1		0.6	15.9	15.9
Effective Green, g (s)	3.6	3.6	25.4		1.0	1.0	21.8	37.1		0.6	15.9	15.9
Actuated g/C Ratio	0.06	0.06	0.41		0.02	0.02	0.35	0.59		0.01	0.25	0.25
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	198	107	644		28	25	1199	2088		17	902	403
v/s Ratio Prot	c0.02	0.00	0.03		c0.01		c0.16	0.24		0.01	c0.15	
v/s Ratio Perm			0.01			0.00						0.04
v/c Ratio	0.30	0.03	0.10		0.36	0.00	0.45	0.40		0.76	0.58	0.14
Uniform Delay, d1	28.2	27.7	11.4		30.4	30.2	15.7	6.7		30.8	20.3	18.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.1		7.7	0.1	0.3	0.1		106.9	0.9	0.2
Delay (s)	29.0	27.9	11.5		38.0	30.3	16.0	6.9		137.7	21.2	18.1
Level of Service	C	C	B		D	C	B	A		F	C	B
Approach Delay (s)		16.5			35.4			10.4			22.5	
Approach LOS		B			D			B			C	

Intersection Summary				
HCM Average Control Delay	14.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	48.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	257	398	584	881	681	117	477	66	138	304	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4621		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4621		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	210	279	433	635	958	740	127	518	72	150	330	104
RTOR Reduction (vph)	0	248	0	0	0	151	0	0	56	0	0	84
Lane Group Flow (vph)	210	464	0	635	958	589	127	518	16	150	330	20
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	15.0	17.6		22.0	24.8	29.9	8.1	19.2	19.2	5.1	16.3	16.3
Effective Green, g (s)	15.0	17.6		22.0	24.8	29.9	8.1	19.2	19.2	5.1	16.3	16.3
Actuated g/C Ratio	0.18	0.21		0.26	0.29	0.35	0.10	0.23	0.23	0.06	0.19	0.19
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	315	964		461	1494	987	329	805	360	207	683	306
v/s Ratio Prot	0.12	0.10		c0.36	c0.19	0.04	0.04	c0.15		c0.04	0.09	
v/s Ratio Perm						0.18			0.01			0.01
v/c Ratio	0.67	0.48		1.38	0.64	0.60	0.39	0.64	0.05	0.72	0.48	0.07
Uniform Delay, d1	32.4	29.4		31.2	25.9	22.3	35.8	29.5	25.4	39.0	30.3	27.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	0.4		183.1	1.0	1.0	0.8	1.8	0.1	11.9	0.5	0.1
Delay (s)	37.6	29.8		214.3	26.9	23.3	36.6	31.3	25.5	50.8	30.8	27.9
Level of Service	D	C		F	C	C	D	C	C	D	C	C
Approach Delay (s)		31.6			76.7			31.6			35.5	
Approach LOS		C			E			C			D	

Intersection Summary				
HCM Average Control Delay	55.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	84.4	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	306	35	348	2109	484	17	16	35	81	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5007		1770	6228			1816	1583	1770	1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.84	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5007		1770	6228			1558	1583	1368	1651	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	333	38	378	2292	526	18	17	38	88	7	22
RTOR Reduction (vph)	0	13	0	0	24	0	0	0	34	0	20	0
Lane Group Flow (vph)	114	358	0	378	2794	0	0	35	4	88	9	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	9.1	11.6		51.2	54.7			9.4	9.4	9.4	9.4	
Effective Green, g (s)	9.1	11.6		51.2	54.7			9.4	9.4	9.4	9.4	
Actuated g/C Ratio	0.10	0.13		0.58	0.62			0.11	0.11	0.11	0.11	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	182	656		1023	3845			165	168	145	175	
v/s Ratio Prot	0.06	c0.07		0.21	c0.45						0.01	
v/s Ratio Perm								0.02	0.00	c0.06		
v/c Ratio	0.63	0.55		0.37	0.73			0.21	0.02	0.61	0.05	
Uniform Delay, d1	38.1	36.0		10.0	11.8			36.2	35.5	37.8	35.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	0.9		0.2	0.7			0.6	0.1	7.0	0.1	
Delay (s)	44.7	37.0		10.3	12.5			36.9	35.5	44.8	35.7	
Level of Service	D	D		B	B			D	D	D	D	
Approach Delay (s)		38.8			12.2			36.2			42.6	
Approach LOS		D			B			D			D	

Intersection Summary				
HCM Average Control Delay	16.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	68.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Cuml (Near-Term) AM
2/15/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	265	192	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	209	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	209				497	209
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209				497	209
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1362				533	832

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	288	209	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.17	0.12	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	211	100	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	229	109	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	109				338	109
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109				338	109
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1482				658	945

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	229	109	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.13	0.06	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1586	58	200	1155	115	40	9	516	227	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5016		1770	1513	1504	3433	3137	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5016		1770	1513	1504	3433	3137	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1724	63	217	1255	125	43	10	561	247	16	50
RTOR Reduction (vph)	0	0	18	0	6	0	0	170	11	0	47	0
Lane Group Flow (vph)	54	1724	45	217	1374	0	43	115	275	247	19	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.5	71.6	78.3	14.8	78.3		21.2	14.5	29.3	14.9	8.5	
Effective Green, g (s)	7.5	71.6	78.3	14.8	78.3		21.2	14.5	29.3	14.9	8.5	
Actuated g/C Ratio	0.06	0.53	0.58	0.11	0.58		0.16	0.11	0.22	0.11	0.06	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	98	2697	918	376	2909		278	163	326	379	198	
v/s Ratio Prot	0.03	c0.34		0.06	0.27		0.02	0.08	c0.09	c0.07	0.01	
v/s Ratio Perm			0.03						0.09			
v/c Ratio	0.55	0.64	0.05	0.58	0.47		0.15	0.71	0.84	0.65	0.10	
Uniform Delay, d1	62.1	22.5	12.3	57.1	16.4		49.2	58.2	50.7	57.6	59.6	
Progression Factor	1.00	1.00	1.00	0.91	0.92		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	1.2	0.0	1.3	0.2		0.1	10.9	17.1	3.1	0.1	
Delay (s)	65.9	23.7	12.3	53.4	15.2		49.3	69.1	67.7	60.6	59.7	
Level of Service	E	C	B	D	B		D	E	E	E	E	
Approach Delay (s)		24.5			20.4			67.1			60.4	
Approach LOS		C			C			E			E	

Intersection Summary				
HCM Average Control Delay	31.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1508	820	0	983	1017	0	0	402	0	0	52
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1639	891	0	1068	1105	0	0	437	0	0	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.95			0.76			0.78	0.78	0.76	0.78	0.78	0.95
vC, conflicting volume	2174			2530			2230	3813	820	2325	3599	534
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2135			2382			1756	3780	130	1878	3506	418
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	36	100	100	90
cM capacity (veh/h)	239			152			38	3	680	12	5	558

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	820	820	891	534	534	1105	437	28	28
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	891	0	0	1105	437	28	28
cSH	1700	1700	1700	1700	1700	1700	680	558	558
Volume to Capacity	0.48	0.48	0.52	0.31	0.31	0.65	0.64	0.05	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	117	4	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	19.3	11.8	11.8
Lane LOS							C	B	B
Approach Delay (s)	0.0			0.0			19.3	11.8	
Approach LOS							C	B	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1105	805	0	1770	680	215	0	384	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1201	875	0	1924	739	234	0	417	0	0	0
RTOR Reduction (vph)	0	0	185	0	0	157	0	0	181	0	0	0
Lane Group Flow (vph)	0	1201	690	0	1924	582	117	117	236	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		106.4	106.4		106.4	106.4	17.8	17.8	17.8			
Effective Green, g (s)		106.4	106.4		106.4	106.4	17.8	17.8	17.8			
Actuated g/C Ratio		0.79	0.79		0.79	0.79	0.13	0.13	0.13			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		4008	1248		4008	1248	222	222	367			
v/s Ratio Prot		0.24			0.38		0.07	0.07	c0.08			
v/s Ratio Perm			c0.44			0.37						
v/c Ratio		0.30	0.55		0.48	0.47	0.53	0.53	0.64			
Uniform Delay, d1		4.0	5.4		4.9	4.8	54.7	54.7	55.6			
Progression Factor		0.59	2.08		0.28	1.60	1.00	1.00	1.00			
Incremental Delay, d2		0.2	1.5		0.3	0.9	2.3	2.3	3.8			
Delay (s)		2.5	12.7		1.7	8.6	56.9	56.9	59.4			
Level of Service		A	B		A	A	E	E	E			
Approach Delay (s)		6.8			3.6			58.5			0.0	
Approach LOS		A			A			E			A	

Intersection Summary				
HCM Average Control Delay	11.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	941	372	163	1685	24	509	122	222	39	114	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	1023	404	177	1832	26	553	133	241	42	124	297
RTOR Reduction (vph)	0	0	0	0	0	5	0	0	149	0	0	156
Lane Group Flow (vph)	191	1023	404	177	1832	21	553	133	92	42	124	141
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	10.1	51.6	135.0	22.9	64.3	33.8	26.4	33.8	51.6	7.5	15.1	64.3
Effective Green, g (s)	10.1	51.6	135.0	22.9	64.3	33.8	26.4	33.8	51.6	7.5	15.1	64.3
Actuated g/C Ratio	0.07	0.38	1.00	0.17	0.48	0.25	0.20	0.25	0.38	0.06	0.11	0.48
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	257	1944	1583	300	2422	396	671	466	605	98	208	754
v/s Ratio Prot	c0.06	0.20		0.10	c0.36		c0.16	0.07		0.02	c0.07	
v/s Ratio Perm			0.26			0.01			0.06			0.09
v/c Ratio	0.74	0.53	0.26	0.59	0.76	0.05	0.82	0.29	0.15	0.43	0.60	0.19
Uniform Delay, d1	61.2	32.2	0.0	51.7	28.9	38.4	52.1	40.9	27.4	61.7	57.0	20.3
Progression Factor	1.08	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.5	1.0	0.4	3.0	2.3	0.1	8.1	0.3	0.5	3.0	4.5	0.6
Delay (s)	76.3	29.6	0.4	54.7	31.2	38.5	60.2	41.2	27.9	64.7	61.6	20.9
Level of Service	E	C	A	D	C	D	E	D	C	E	E	C
Approach Delay (s)		27.8			33.3			49.1			35.8	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	34.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	76.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	988	38	92	1110	41	93	4	49	76	5	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	5057		1770	5058			1777	1583		1779	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.61	1.00
Satd. Flow (perm)	1770	5057		1770	5058			1230	1583		1136	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1074	41	100	1207	45	101	4	53	83	5	90
RTOR Reduction (vph)	0	3	0	0	3	0	0	0	46	0	0	77
Lane Group Flow (vph)	109	1112	0	100	1249	0	0	105	7	0	88	13
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	9.8	60.4		9.4	60.0			13.2	13.2		13.2	13.2
Effective Green, g (s)	9.8	60.4		9.4	60.0			13.2	13.2		13.2	13.2
Actuated g/C Ratio	0.10	0.64		0.10	0.63			0.14	0.14		0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	183	3215		175	3195			171	220		158	220
v/s Ratio Prot	c0.06	0.22		0.06	c0.25							
v/s Ratio Perm								c0.09	0.00		0.08	0.01
v/c Ratio	0.60	0.35		0.57	0.39			0.61	0.03		0.56	0.06
Uniform Delay, d1	40.7	8.1		40.9	8.6			38.5	35.4		38.2	35.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.1	0.3		4.5	0.4			6.4	0.1		4.2	0.1
Delay (s)	45.8	8.4		45.3	8.9			44.9	35.4		42.4	35.6
Level of Service	D	A		D	A			D	D		D	D
Approach Delay (s)		11.7			11.6			41.7			39.0	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	15.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	917	169	201	829	34	203	87	164	77	151	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4966		3433	5085	1583	1770	3193		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4966		3433	5085	1583	1770	3193		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	997	184	218	901	37	221	95	178	84	164	320
RTOR Reduction (vph)	0	19	0	0	0	17	0	117	0	0	0	181
Lane Group Flow (vph)	147	1162	0	218	901	20	221	156	0	84	164	139
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	10.8	45.7		13.1	47.9	47.9	21.4	46.5		11.0	36.1	36.1
Effective Green, g (s)	10.8	45.7		13.1	47.9	47.9	21.4	46.5		11.0	36.1	36.1
Actuated g/C Ratio	0.08	0.34		0.10	0.35	0.35	0.16	0.34		0.08	0.27	0.27
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	275	1681		333	1804	562	281	1100		144	498	423
v/s Ratio Prot	0.04	c0.23		c0.06	0.18		c0.12	0.05		c0.05	c0.09	
v/s Ratio Perm						0.01						0.09
v/c Ratio	0.53	0.69		0.65	0.50	0.04	0.79	0.14		0.58	0.33	0.33
Uniform Delay, d1	59.7	38.6		58.8	34.1	28.5	54.6	30.5		59.8	39.7	39.7
Progression Factor	1.00	1.00		0.90	0.55	0.29	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	2.4		4.1	0.9	0.1	13.5	0.1		5.9	1.8	2.1
Delay (s)	61.7	40.9		56.8	19.6	8.5	68.1	30.6		65.7	41.5	41.8
Level of Service	E	D		E	B	A	E	C		E	D	D
Approach Delay (s)		43.2			26.2			47.4			45.2	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.2	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	318	891	125	227	462	123	228	520	191	545	434	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4991		3433	4925		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4991		3433	4925		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	346	968	136	247	502	134	248	565	208	592	472	316
RTOR Reduction (vph)	0	14	0	0	35	0	0	0	79	0	0	183
Lane Group Flow (vph)	346	1090	0	247	601	0	248	565	129	592	472	133
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	18.2	47.8		6.6	36.3		12.8	38.4	38.4	22.6	48.4	48.4
Effective Green, g (s)	18.2	47.8		6.6	36.3		12.8	38.4	38.4	22.6	48.4	48.4
Actuated g/C Ratio	0.13	0.35		0.05	0.27		0.09	0.28	0.28	0.17	0.36	0.36
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	463	1767		168	1324		325	1007	450	575	1269	568
v/s Ratio Prot	c0.10	c0.22		c0.07	0.12		c0.07	c0.16		c0.17	0.13	
v/s Ratio Perm									0.08			0.08
v/c Ratio	0.75	0.62		1.47	0.45		0.76	0.56	0.29	1.03	0.37	0.23
Uniform Delay, d1	56.2	36.0		64.2	41.1		59.6	41.1	37.6	56.2	32.1	30.3
Progression Factor	0.60	0.61		0.87	0.80		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	1.4		240.9	1.1		10.2	2.3	1.6	45.3	0.8	1.0
Delay (s)	39.4	23.3		297.1	33.9		69.8	43.4	39.2	101.5	32.9	31.3
Level of Service	D	C		F	C		E	D	D	F	C	C
Approach Delay (s)		27.1			107.5			49.0			62.0	
Approach LOS		C			F			D			E	

Intersection Summary				
HCM Average Control Delay	57.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	17.6	
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Clairemont Mesa Boulevard & Murphy Canyon Road

Ex + Cumu PM
3/25/2013

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1350	202	194	638	164	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1467	220	211	693	178	460
RTOR Reduction (vph)	0	0	23	0	0	0	12
Lane Group Flow (vph)	0	1467	197	211	693	178	448
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		79.1	79.1	21.6	105.7	18.9	40.5
Effective Green, g (s)		79.1	79.1	21.6	105.7	18.9	40.5
Actuated g/C Ratio		0.59	0.59	0.16	0.78	0.14	0.30
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2074	928	283	3981	248	526
v/s Ratio Prot		c0.41		0.12	0.14	0.10	c0.14
v/s Ratio Perm			0.12				0.15
v/c Ratio		0.71	0.21	0.75	0.17	0.72	0.85
Uniform Delay, d1		19.8	13.2	54.1	3.7	55.5	44.4
Progression Factor		0.20	0.12	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.0	0.5	10.2	0.1	9.5	12.6
Delay (s)		5.9	2.1	64.3	3.8	65.0	57.0
Level of Service		A	A	E	A	E	E
Approach Delay (s)		5.4			17.9	59.2	
Approach LOS		A			B	E	

Intersection Summary				
HCM Average Control Delay	19.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
10: Clairemont Mesa Boulevard & I-15 SB Off-Ramp

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1210	564	207	625	0	0	0	0	777	7	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1607	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1607	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1315	613	225	679	0	0	0	0	845	8	238
RTOR Reduction (vph)	0	0	337	0	0	0	0	0	0	0	3	100
Lane Group Flow (vph)	0	1315	276	225	679	0	0	0	0	439	435	114
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		36.0	36.0	7.2	47.2					24.8	24.8	24.8
Effective Green, g (s)		36.0	36.0	7.2	47.2					24.8	24.8	24.8
Actuated g/C Ratio		0.45	0.45	0.09	0.59					0.31	0.31	0.31
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1593	1254	309	2088					521	498	466
v/s Ratio Prot		c0.37		c0.07	0.19					0.26	c0.27	
v/s Ratio Perm			0.10									0.08
v/c Ratio		0.83	0.22	0.73	0.33					0.84	0.87	0.24
Uniform Delay, d1		19.3	13.4	35.4	8.3					25.8	26.1	20.6
Progression Factor		1.00	1.00	0.92	0.67					1.00	1.00	1.00
Incremental Delay, d2		3.6	0.1	7.5	0.4					11.8	15.6	0.3
Delay (s)		22.9	13.5	40.1	6.0					37.6	41.7	20.9
Level of Service		C	B	D	A					D	D	C
Approach Delay (s)		19.9			14.5			0.0			36.0	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM Average Control Delay	23.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	540	1484	0	0	536	86	336	0	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3466		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3466		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	1613	0	0	583	93	365	0	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	34	0	0	0
Lane Group Flow (vph)	587	1613	0	0	662	0	365	0	159	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	18.7	56.3			33.4		13.7		13.7			
Effective Green, g (s)	18.7	56.3			33.4		13.7		13.7			
Actuated g/C Ratio	0.23	0.70			0.42		0.17		0.17			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	802	2491			1447		588		271			
v/s Ratio Prot	c0.17	c0.46			0.19		c0.11					
v/s Ratio Perm									0.10			
v/c Ratio	0.73	0.65			0.46		0.62		0.59			
Uniform Delay, d1	28.3	6.4			16.8		30.7		30.5			
Progression Factor	0.83	0.49			1.00		1.00		1.00			
Incremental Delay, d2	2.0	0.7			1.0		2.0		3.2			
Delay (s)	25.5	3.9			17.8		32.8		33.8			
Level of Service	C	A			B		C		C			
Approach Delay (s)		9.7			17.8			33.1			0.0	
Approach LOS		A			B			C			A	

Intersection Summary				
HCM Average Control Delay	15.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2	
Intersection Capacity Utilization	86.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
12: Lightwave Avenue & Overland Avenue

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	166	80	69	181	211	86	176	107	286	189	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3366		1770	3254		1770	3339		1770	3366	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3366		1770	3254		1770	3339		1770	3366	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	180	87	75	197	229	93	191	116	311	205	99
RTOR Reduction (vph)	0	68	0	0	190	0	0	95	0	0	57	0
Lane Group Flow (vph)	142	199	0	75	236	0	93	212	0	311	247	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.7	12.3		5.7	10.3		6.4	10.9		13.1	17.6	
Effective Green, g (s)	7.7	12.3		5.7	10.3		6.4	10.9		13.1	17.6	
Actuated g/C Ratio	0.13	0.20		0.09	0.17		0.11	0.18		0.22	0.29	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	225	683		166	553		187	601		383	978	
v/s Ratio Prot	c0.08	0.06		0.04	c0.07		0.05	c0.06		c0.18	0.07	
v/s Ratio Perm												
v/c Ratio	0.63	0.29		0.45	0.43		0.50	0.35		0.81	0.25	
Uniform Delay, d1	25.1	20.5		26.0	22.5		25.6	21.8		22.6	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.3		0.7	0.6		0.8	0.4		11.7	0.2	
Delay (s)	29.3	20.7		26.7	23.1		26.3	22.2		34.3	16.6	
Level of Service	C	C		C	C		C	C		C	B	
Approach Delay (s)		23.7			23.6			23.1			25.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	18.6	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	72	561	1062	780	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3527	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	78	610	1154	848	20
RTOR Reduction (vph)	0	70	0	0	2	0
Lane Group Flow (vph)	88	8	610	1154	866	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	8.1	8.1	32.7	60.6	23.7	
Effective Green, g (s)	8.1	8.1	32.7	60.6	23.7	
Actuated g/C Ratio	0.10	0.10	0.41	0.76	0.30	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	179	160	723	2681	1045	
v/s Ratio Prot	c0.05		c0.34	0.33	c0.25	
v/s Ratio Perm		0.00				
v/c Ratio	0.49	0.05	0.84	0.43	0.83	
Uniform Delay, d1	34.0	32.5	21.3	3.5	26.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	0.1	8.9	0.5	7.6	
Delay (s)	36.1	32.6	30.2	4.0	33.8	
Level of Service	D	C	C	A	C	
Approach Delay (s)	34.5			13.1	33.8	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	5	209	0	0	0	0	1466	389	415	436	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1776	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1776	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	5	227	0	0	0	0	1593	423	451	474	0
RTOR Reduction (vph)	0	0	196	0	0	0	0	0	200	0	0	0
Lane Group Flow (vph)	0	175	31	0	0	0	0	1593	223	451	474	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		13.8	13.8					43.7	43.7	27.0	74.9	
Effective Green, g (s)		13.8	13.8					43.7	43.7	27.0	74.9	
Actuated g/C Ratio		0.14	0.14					0.44	0.44	0.27	0.75	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		245	385					1547	692	478	2651	
v/s Ratio Prot								c0.45		c0.25	0.13	
v/s Ratio Perm		0.10	0.01						0.14			
v/c Ratio		0.71	0.08					1.03	0.32	0.94	0.18	
Uniform Delay, d1		41.2	37.6					28.1	18.4	35.8	3.6	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		9.5	0.1					30.9	1.2	27.4	0.1	
Delay (s)		50.7	37.7					59.0	19.7	63.1	3.8	
Level of Service		D	D					E	B	E	A	
Approach Delay (s)		43.3			0.0			50.8			32.7	
Approach LOS		D			A			D			C	

Intersection Summary				
HCM Average Control Delay	44.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	85.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	379	4	22	43	32	82	29	1391	4	14	525	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.97	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1687	1583	1770	1662		1770	3538		3433	3450	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1687	1583	1770	1662		1770	3538		3433	3450	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	412	4	24	47	35	89	32	1512	4	15	571	115
RTOR Reduction (vph)	0	0	20	0	84	0	0	0	0	0	20	0
Lane Group Flow (vph)	206	210	4	47	40	0	32	1516	0	15	666	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.1	13.1	13.1	3.7	3.7		1.7	36.9		0.7	35.9	
Effective Green, g (s)	13.1	13.1	13.1	3.7	3.7		1.7	36.9		0.7	35.9	
Actuated g/C Ratio	0.19	0.19	0.19	0.05	0.05		0.02	0.52		0.01	0.51	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	313	314	295	93	87		43	1854		34	1759	
v/s Ratio Prot	0.12	c0.12		c0.03	0.02		c0.02	c0.43		0.00	0.19	
v/s Ratio Perm			0.00									
v/c Ratio	0.66	0.67	0.02	0.51	0.46		0.74	0.82		0.44	0.38	
Uniform Delay, d1	26.6	26.6	23.4	32.5	32.4		34.1	13.9		34.7	10.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	5.3	0.0	4.3	3.8		50.5	2.9		8.9	0.1	
Delay (s)	31.5	32.0	23.4	36.7	36.1		84.6	16.9		43.5	10.6	
Level of Service	C	C	C	D	D		F	B		D	B	
Approach Delay (s)		31.3			36.3			18.3			11.3	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM Average Control Delay	19.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	20	152	98	55	167	67	1040	35	37	536	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1789	1583		1805	1583	1770	3522		1770	3495	
Flt Permitted		0.65	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1220	1583		1365	1583	1770	3522		1770	3495	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	22	165	107	60	182	73	1130	38	40	583	53
RTOR Reduction (vph)	0	0	133	0	0	111	0	2	0	0	6	0
Lane Group Flow (vph)	0	124	32	0	167	71	73	1166	0	40	630	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		11.3	11.3		11.9	11.9	4.1	30.3		1.8	28.0	
Effective Green, g (s)		11.3	11.3		11.9	11.9	4.1	30.3		1.8	28.0	
Actuated g/C Ratio		0.19	0.19		0.20	0.20	0.07	0.52		0.03	0.48	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		235	305		277	321	124	1821		54	1670	
v/s Ratio Prot							c0.04	c0.33		0.02	0.18	
v/s Ratio Perm		0.10	0.02		c0.12	0.04						
v/c Ratio		0.53	0.10		0.60	0.22	0.59	0.64		0.74	0.38	
Uniform Delay, d1		21.3	19.5		21.2	19.5	26.4	10.2		28.2	9.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.1		2.5	0.1	4.5	0.9		37.5	0.2	
Delay (s)		22.2	19.5		23.7	19.6	31.0	11.1		65.7	10.0	
Level of Service		C	B		C	B	C	B		E	A	
Approach Delay (s)		20.7			21.6			12.3			13.3	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	60.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	0	36	8	0	9	13	871	2	1	700	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1690		3433	3538		1770	3533	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1690		3433	3538		1770	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	39	9	0	10	14	947	2	1	761	9
RTOR Reduction (vph)	0	35	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	83	4	0	0	9	0	14	949	0	1	769	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Effective Green, g (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Actuated g/C Ratio	0.11	0.11			0.02		0.01	0.47		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	202	181			30		34	1678		17	1676	
v/s Ratio Prot	c0.05	0.00			c0.01		c0.00	c0.27		0.00	0.22	
v/s Ratio Perm												
v/c Ratio	0.41	0.02			0.31		0.41	0.57		0.06	0.46	
Uniform Delay, d1	20.9	20.0			24.6		25.0	9.6		24.9	9.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			2.1		2.9	0.9		0.5	0.5	
Delay (s)	21.4	20.0			26.7		27.9	10.4		25.4	9.5	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		21.0			26.7			10.7			9.5	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	11.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	6	150	151	30	66	70	741	23	4	957	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1777	1583		1788	1583	3433	3523		1770	3513	
Flt Permitted		0.58	1.00		0.65	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1082	1583		1207	1583	3433	3523		1770	3513	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	7	163	164	33	72	76	805	25	4	1040	53
RTOR Reduction (vph)	0	0	125	0	0	55	0	2	0	0	4	0
Lane Group Flow (vph)	0	174	38	0	197	17	76	828	0	4	1089	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		13.2	13.2		13.2	13.2	2.2	28.1		0.7	26.6	
Effective Green, g (s)		13.2	13.2		13.2	13.2	2.2	28.1		0.7	26.6	
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.04	0.50		0.01	0.47	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		252	369		281	369	133	1749		22	1651	
v/s Ratio Prot							c0.02	0.24		0.00	c0.31	
v/s Ratio Perm		0.16	0.02		c0.16	0.01						
v/c Ratio		0.69	0.10		0.70	0.05	0.57	0.47		0.18	0.66	
Uniform Delay, d1		19.8	17.0		19.9	16.8	26.7	9.4		27.7	11.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.4	0.0		6.3	0.0	3.6	0.5		1.4	1.5	
Delay (s)		26.3	17.1		26.2	16.8	30.4	9.9		29.1	13.0	
Level of Service		C	B		C	B	C	A		C	B	
Approach Delay (s)		21.8			23.7			11.6			13.1	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	59.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
20: Lightwave Avenue & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	205	66	292	68	112	185	238	718	27	89	644	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1689		3433	3520		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1689		3433	3520		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	72	317	74	122	201	259	780	29	97	700	201
RTOR Reduction (vph)	0	0	77	0	60	0	0	3	0	0	0	121
Lane Group Flow (vph)	223	72	240	74	263	0	259	806	0	97	700	80
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	10.1	22.3	35.8	6.9	19.7		13.5	29.2		7.9	23.6	33.7
Effective Green, g (s)	10.1	22.3	35.8	6.9	19.7		13.5	29.2		7.9	23.6	33.7
Actuated g/C Ratio	0.12	0.26	0.42	0.08	0.23		0.16	0.35		0.09	0.28	0.40
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	411	492	671	145	394		549	1218		166	990	632
v/s Ratio Prot	c0.06	0.04	c0.06	0.04	c0.16		0.08	c0.23		0.05	c0.20	0.02
v/s Ratio Perm			0.09									0.04
v/c Ratio	0.54	0.15	0.36	0.51	0.67		0.47	0.66		0.58	0.71	0.13
Uniform Delay, d1	35.0	23.8	16.5	37.1	29.4		32.2	23.4		36.7	27.3	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.1	0.3	3.0	4.3		0.6	1.4		5.2	2.3	0.1
Delay (s)	36.4	23.9	16.8	40.1	33.6		32.9	24.8		41.8	29.6	16.1
Level of Service	D	C	B	D	C		C	C		D	C	B
Approach Delay (s)		24.8			34.8			26.7			28.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	84.4	Sum of lost time (s)	17.5	
Intersection Capacity Utilization	63.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	0	567	16	4	16	237	672	4	15	929	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Flt Permitted	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	0	616	17	4	17	258	730	4	16	1010	77
RTOR Reduction (vph)	0	0	232	0	0	16	0	0	0	0	0	25
Lane Group Flow (vph)	170	0	384	0	21	1	258	734	0	16	1010	52
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	9.3		23.6		3.7	3.7	14.3	42.7		0.7	29.1	29.1
Effective Green, g (s)	9.3		23.6		3.7	3.7	14.3	42.7		0.7	29.1	29.1
Actuated g/C Ratio	0.12		0.31		0.05	0.05	0.19	0.56		0.01	0.38	0.38
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	417		488		87	77	642	1974		16	1346	602
v/s Ratio Prot	0.05		c0.15		c0.01		0.08	0.21		0.01	c0.29	
v/s Ratio Perm			0.10			0.00						0.03
v/c Ratio	0.41		0.79		0.24	0.01	0.40	0.37		1.00	0.75	0.09
Uniform Delay, d1	31.1		24.1		35.0	34.7	27.3	9.4		37.9	20.6	15.2
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7		8.2		1.4	0.1	0.4	0.1		225.0	2.4	0.1
Delay (s)	31.7		32.3		36.5	34.7	27.8	9.5		262.9	23.0	15.2
Level of Service	C		C		D	C	C	A		F	C	B
Approach Delay (s)		32.2			35.7			14.3			25.9	
Approach LOS		C			D			B			C	

Intersection Summary				
HCM Average Control Delay	23.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	19.2	
Intersection Capacity Utilization	76.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Ex + Cumu PM
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	144	918	167	109	503	318	430	519	361	678	649	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	998	182	118	547	346	467	564	392	737	705	246
RTOR Reduction (vph)	0	22	0	0	0	99	0	0	85	0	0	141
Lane Group Flow (vph)	157	1158	0	118	547	247	467	564	307	737	705	105
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	7.7	32.5		7.3	32.3	49.1	17.3	30.3	30.3	16.8	29.9	29.9
Effective Green, g (s)	7.7	32.5		7.3	32.3	49.1	17.3	30.3	30.3	16.8	29.9	29.9
Actuated g/C Ratio	0.07	0.30		0.07	0.30	0.46	0.16	0.28	0.28	0.16	0.28	0.28
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	127	1503		120	1529	1274	553	998	447	537	985	441
v/s Ratio Prot	c0.09	c0.23		c0.07	0.11	0.03	0.14	0.16		c0.21	c0.20	
v/s Ratio Perm						0.06			0.19			0.07
v/c Ratio	1.24	0.77		0.98	0.36	0.19	0.84	0.57	0.69	1.37	0.72	0.24
Uniform Delay, d1	49.9	34.1		50.0	29.4	17.4	43.7	32.9	34.3	45.3	34.9	30.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	156.6	2.5		76.5	0.1	0.1	11.3	0.7	4.3	179.2	2.5	0.3
Delay (s)	206.5	36.6		126.5	29.6	17.4	55.1	33.7	38.6	224.5	37.4	30.2
Level of Service	F	D		F	C	B	E	C	D	F	D	C
Approach Delay (s)		56.5			36.7			42.1			118.0	
Approach LOS		E			D			D			F	

Intersection Summary				
HCM Average Control Delay	68.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	18.5	
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1963	36	47	800	62	33	7	484	451	15	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5072		1770	6339			1790	1583	1770	1619	
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5072		1770	6339			1432	1583	1357	1619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	2134	39	51	870	67	36	8	526	490	16	109
RTOR Reduction (vph)	0	2	0	0	10	0	0	0	61	0	68	0
Lane Group Flow (vph)	48	2171	0	51	927	0	0	44	465	490	57	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	6.5	53.7		3.7	51.9			44.0	44.0	44.0	44.0	
Effective Green, g (s)	6.5	53.7		3.7	51.9			44.0	44.0	44.0	44.0	
Actuated g/C Ratio	0.06	0.46		0.03	0.44			0.37	0.37	0.37	0.37	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	98	2312		56	2793			535	591	507	605	
v/s Ratio Prot	0.03	c0.43		c0.03	0.15						0.04	
v/s Ratio Perm								0.03	0.29	c0.36		
v/c Ratio	0.49	0.94		0.91	0.33			0.08	0.79	0.97	0.09	
Uniform Delay, d1	54.0	30.5		56.9	21.6			23.8	32.7	36.2	24.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	8.2		88.0	0.1			0.1	6.8	31.2	0.1	
Delay (s)	57.9	38.7		144.9	21.7			23.9	39.5	67.4	24.0	
Level of Service	E	D		F	C			C	D	E	C	
Approach Delay (s)		39.1			28.0			38.3			58.6	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

ILV ANALYSIS WORKSHEETS

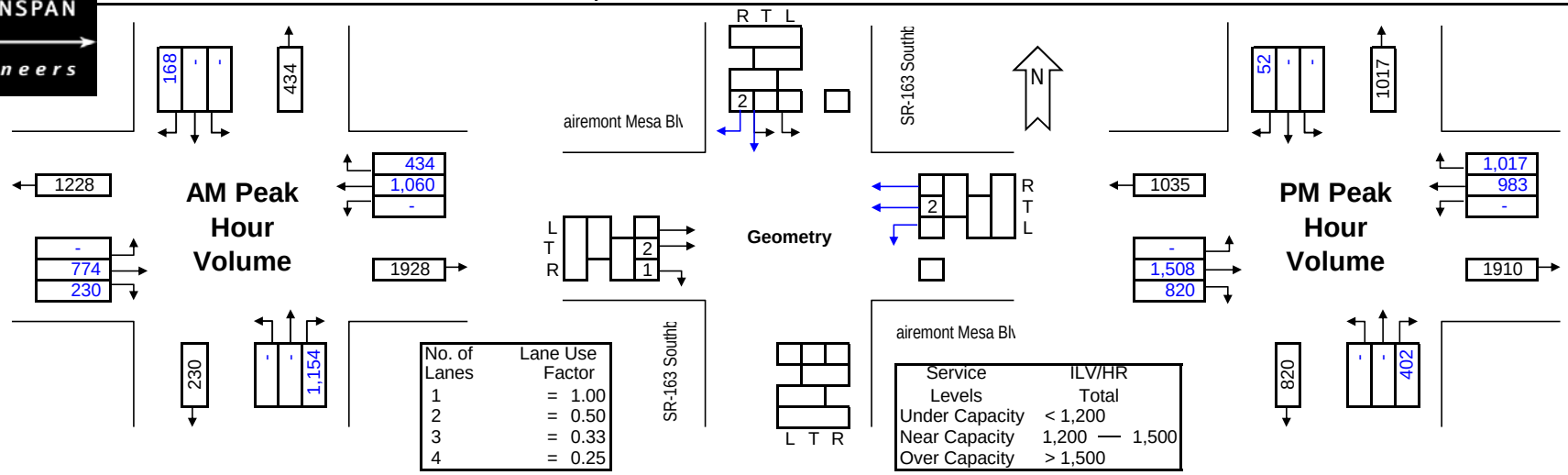
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Cuml Projects
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



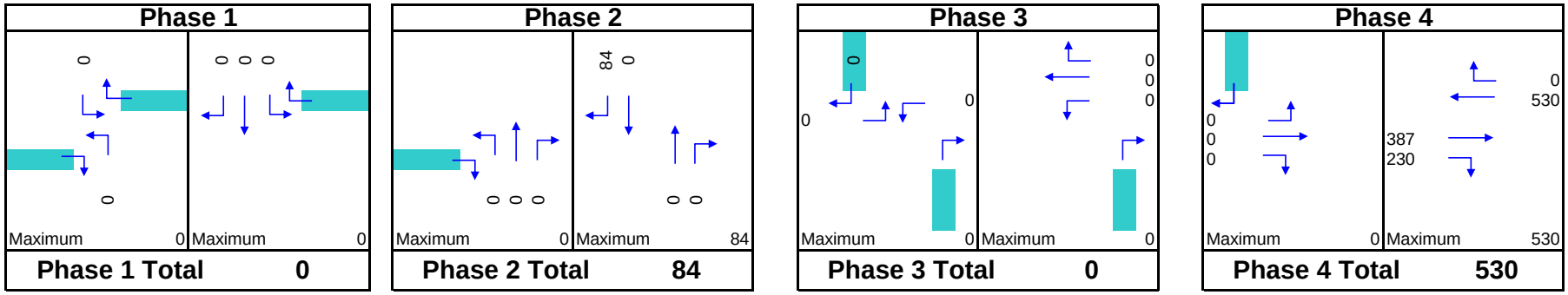
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 614

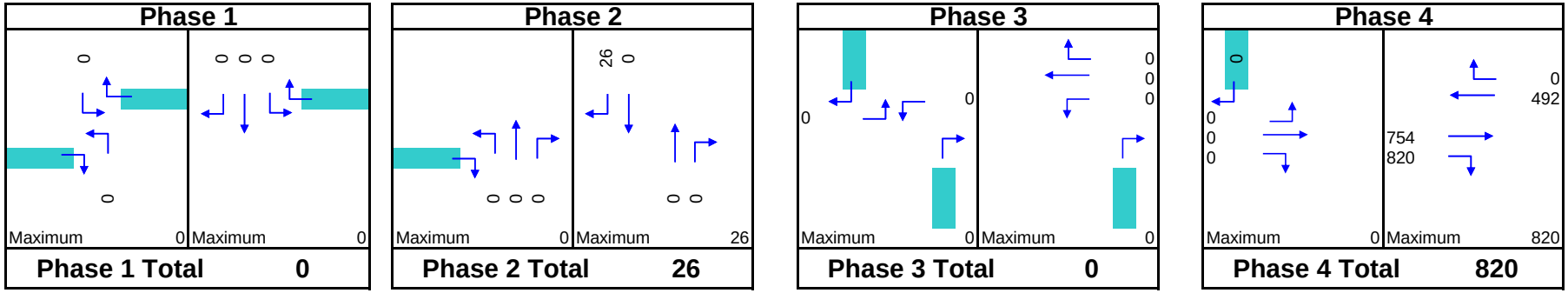
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 846

Service Level: **Under Capacity**



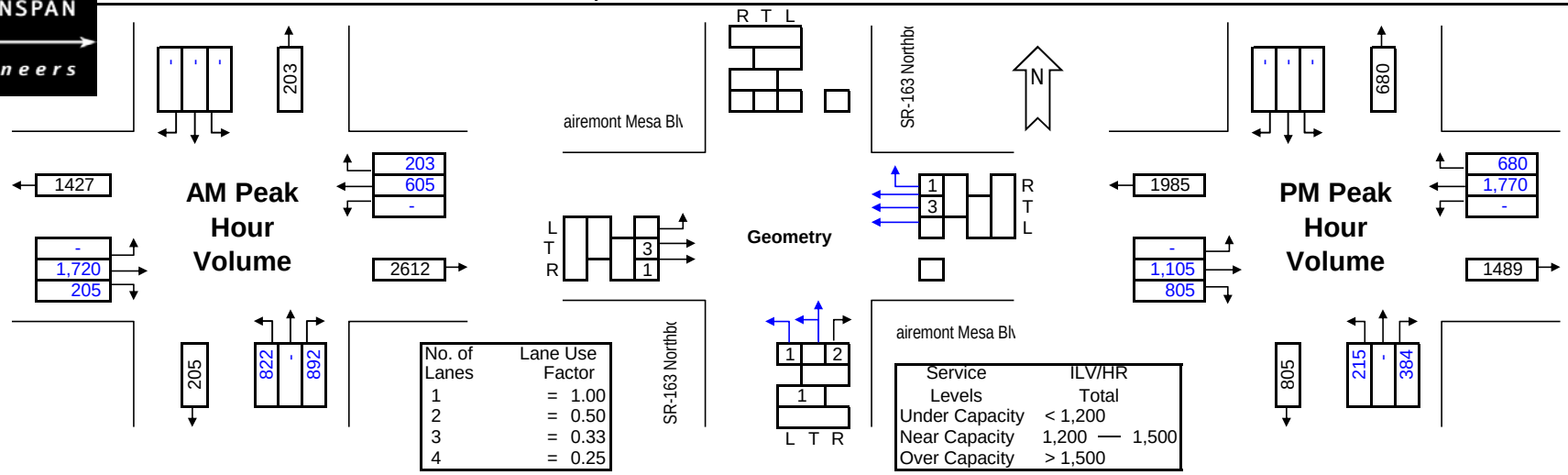
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Cuml Projects
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



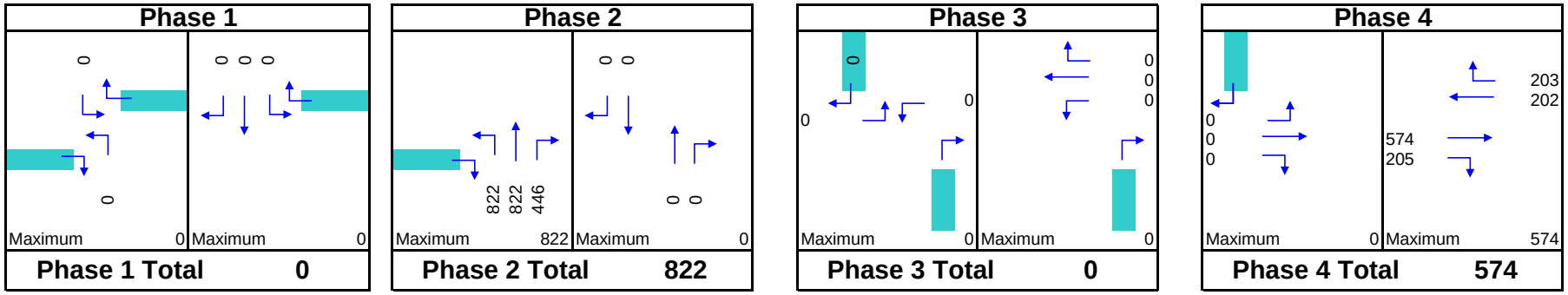
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1396

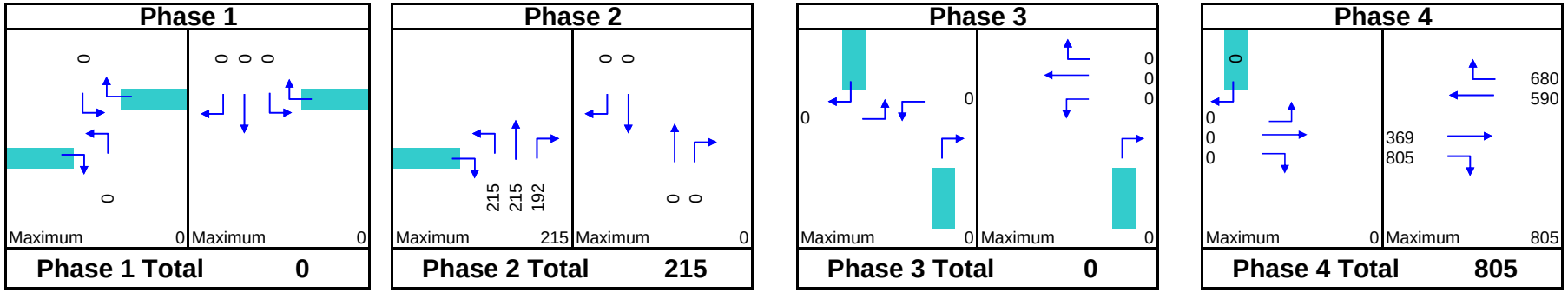
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1020

Service Level: **Under Capacity**



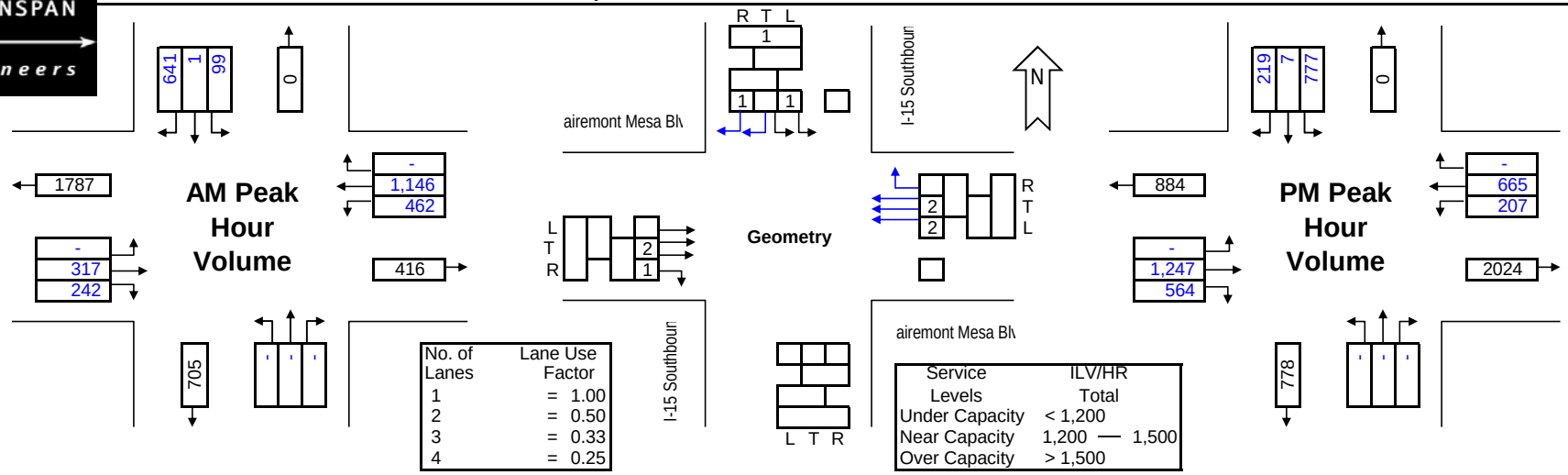
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Cuml Projects
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



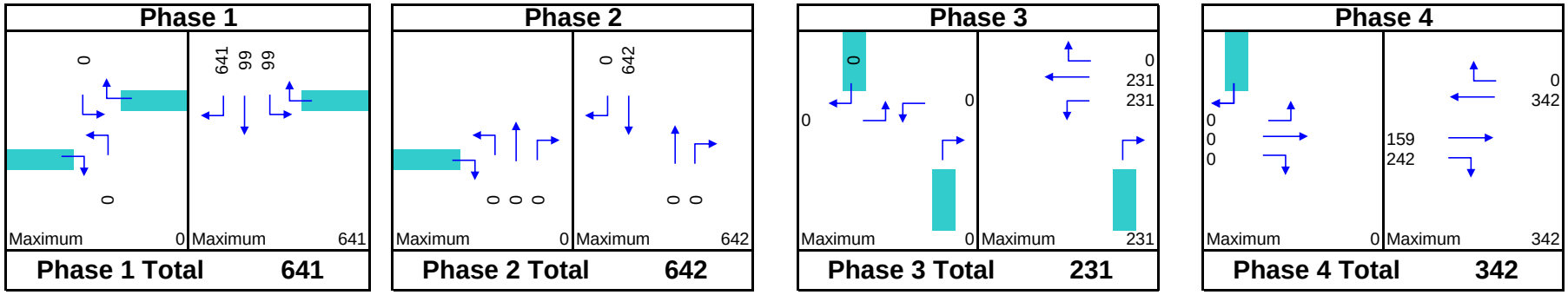
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1856

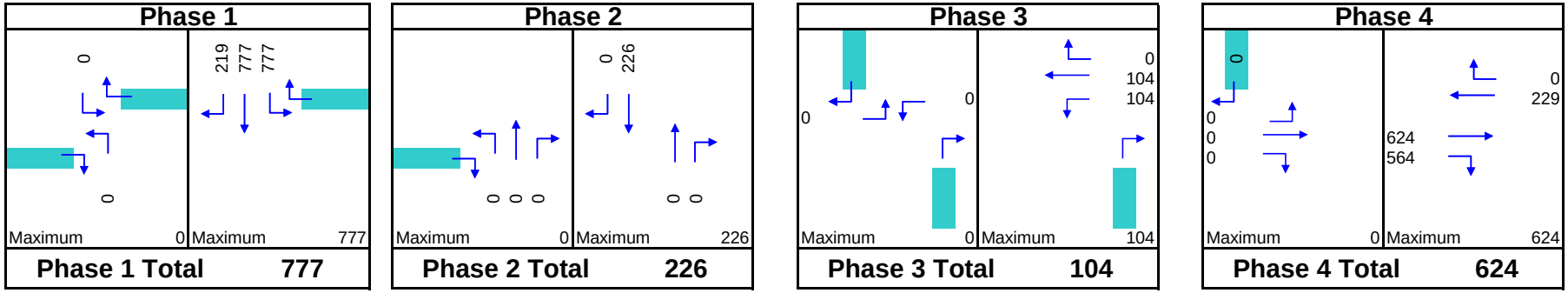
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1731

Service Level: **Over Capacity**



LINSCOTT LAW & GREENSPAN engineers

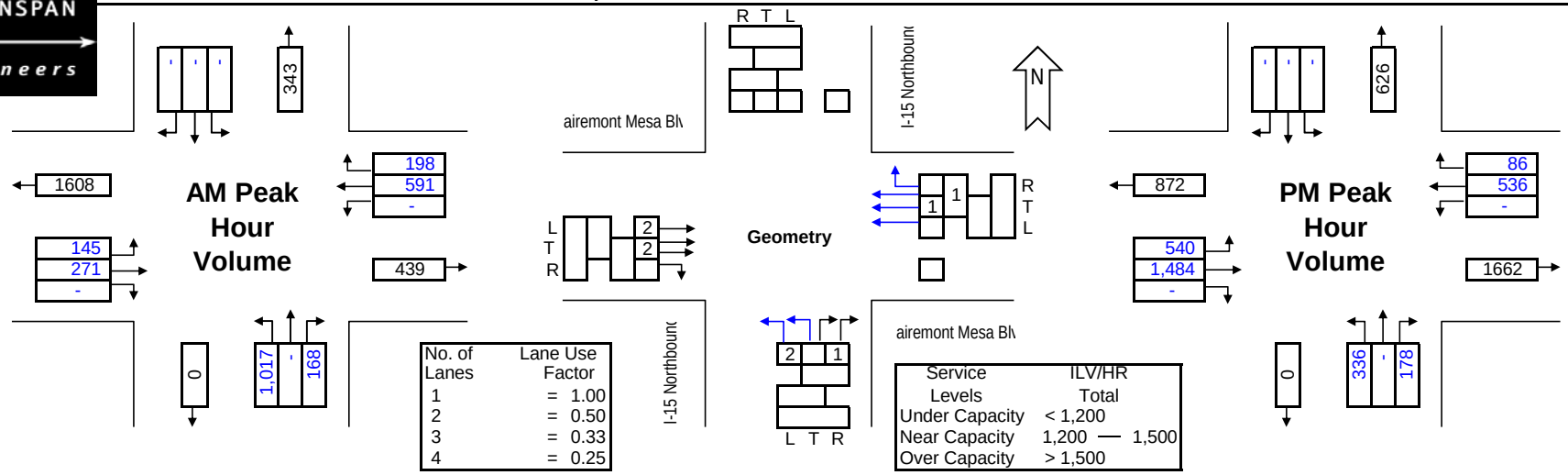
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Cuml Projects
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



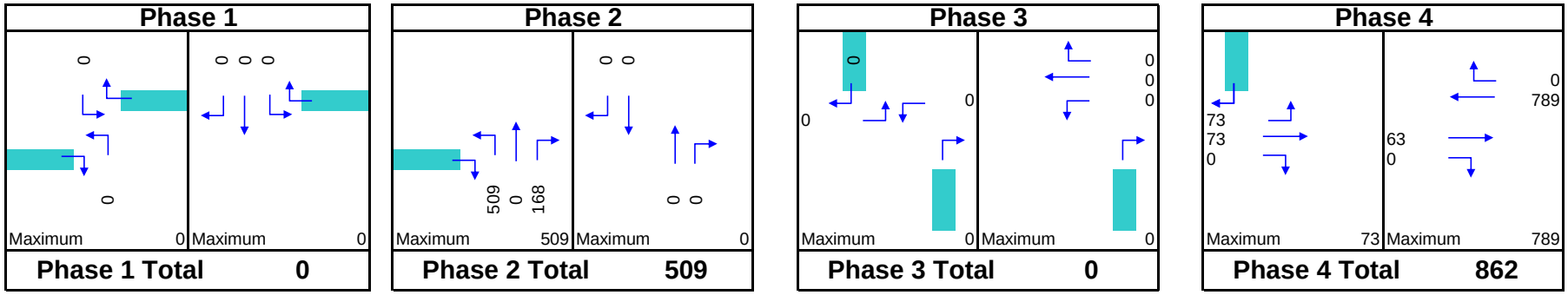
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1371

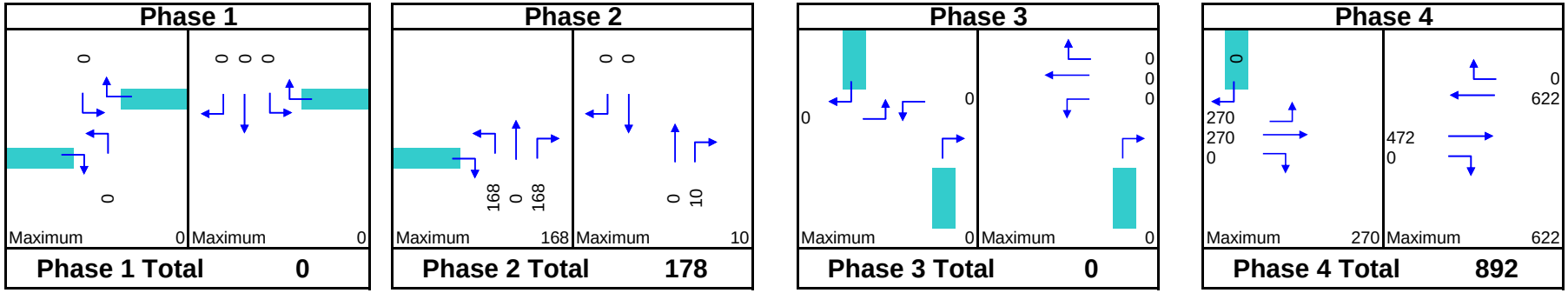
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1070

Service Level: **Under Capacity**



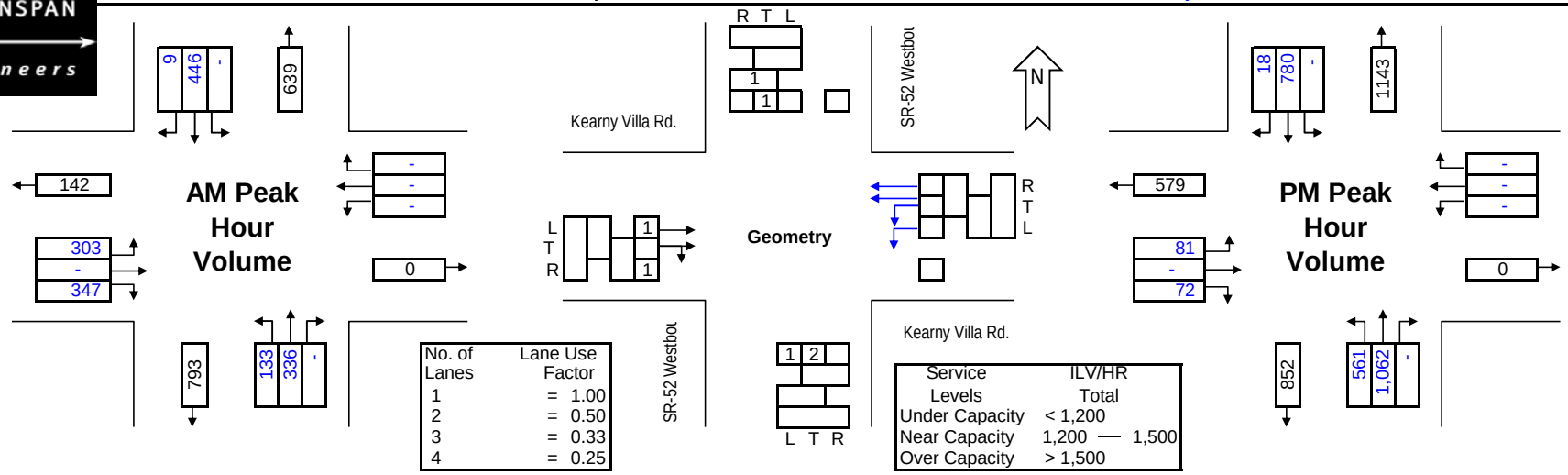
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Cuml Projects
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps N/S
at Kearny Villa Rd. E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 935

Service Level: **Under Capacity**

Phase 1

Maximum 0 | Maximum 0

Phase 1 Total 0

Phase 2

Maximum 133 | Maximum 455

Phase 2 Total 588

Phase 3

Maximum 0 | Maximum 0

Phase 3 Total 0

Phase 4

Maximum 303 | Maximum 44

Phase 4 Total 347

PM Peak Hour Analysis

Total Crictical Lane Volume 1440

Service Level: **Near Capacity**

Phase 1

Maximum 0 | Maximum 0

Phase 1 Total 0

Phase 2

Maximum 561 | Maximum 798

Phase 2 Total 1359

Phase 3

Maximum 0 | Maximum 0

Phase 3 Total 0

Phase 4

Maximum 81 | Maximum 0

Phase 4 Total 81

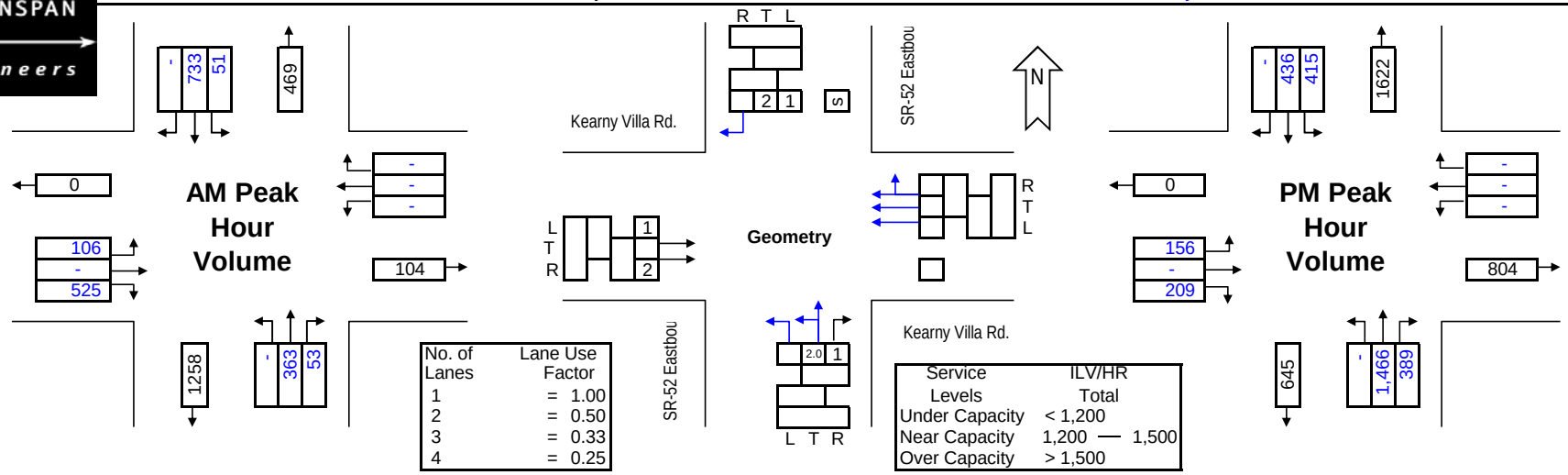
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + Cuml Projects
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps N/S
at Kearny Villa Rd. E/W



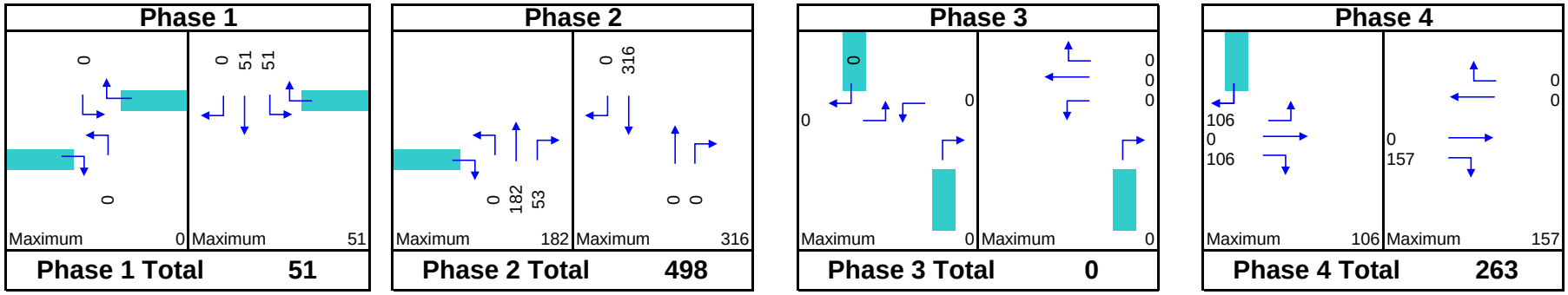
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 812

Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1304

Service Level: **Near Capacity**

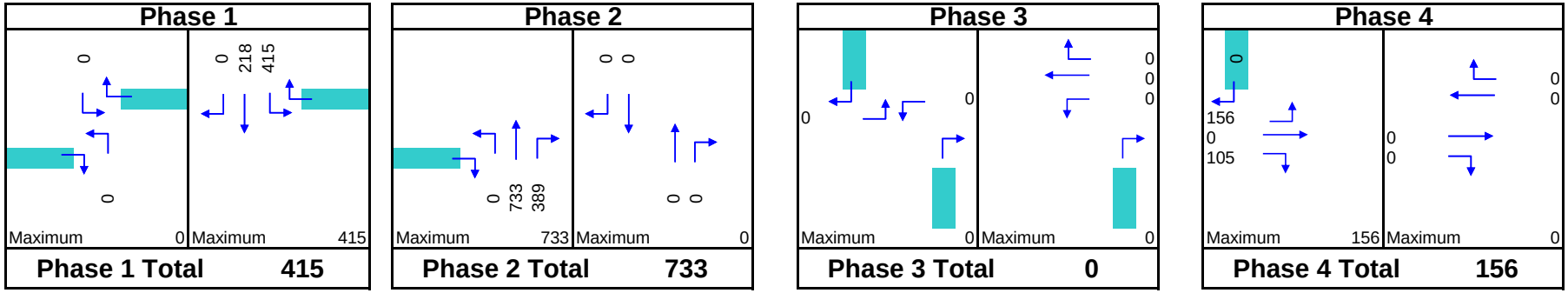


Table X
Existing + Cuml Projects ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	614	Under Capacity
	PM	846	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,396	Near Capacity
	PM	1,020	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	1,856	Over Capacity
	PM	1,731	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,371	Near Capacity
	PM	1,070	Under Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	935	Under Capacity
	PM	1,440	Near Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	812	Under Capacity
	PM	1,304	Near Capacity

APPENDIX G

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS AND ARTERIAL ANALYSIS WORKSHEETS - NEAR TERM + PROJECT PHASE I

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	709	23	275	1570	199	22	10	172	123	13	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.87	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5000		1770	1533	1504	3433	3166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5000		1770	1533	1504	3433	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	771	25	299	1707	216	24	11	187	134	14	33
RTOR Reduction (vph)	0	0	9	0	10	0	0	83	77	0	29	0
Lane Group Flow (vph)	35	771	16	299	1913	0	24	18	20	134	18	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	4.7	59.9	68.5	13.9	68.5		2.8	8.3	22.2	8.7	14.5	
Effective Green, g (s)	4.7	59.9	68.5	13.9	68.5		2.8	8.3	22.2	8.7	14.5	
Actuated g/C Ratio	0.04	0.54	0.62	0.13	0.62		0.03	0.08	0.20	0.08	0.13	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	76	2769	986	434	3114		45	116	304	272	417	
v/s Ratio Prot	0.02	0.15		c0.09	c0.38		0.01	c0.01	0.01	c0.04	0.01	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.46	0.28	0.02	0.69	0.61		0.53	0.15	0.06	0.49	0.04	
Uniform Delay, d1	51.4	13.4	7.9	46.0	12.7		53.0	47.6	35.5	48.5	41.7	
Progression Factor	1.00	1.00	1.00	1.17	0.58		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.3	0.0	3.5	0.4		6.0	0.2	0.0	0.5	0.0	
Delay (s)	53.0	13.7	7.9	57.3	7.7		58.9	47.8	35.5	49.0	41.7	
Level of Service	D	B	A	E	A		E	D	D	D	D	
Approach Delay (s)		15.2			14.4			43.6			47.1	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	18.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	774	230	0	1061	445	0	0	1155	0	0	168
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	841	250	0	1153	484	0	0	1255	0	0	183
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.98			0.92			0.93	0.93	0.92	0.93	0.93	0.98
vC, conflicting volume	1637			1091			1601	2478	421	2829	2245	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1602			916			1372	2318	184	2696	2066	515
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	63
cM capacity (veh/h)	394			678			61	35	757	0	50	492

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	421	421	250	577	577	484	1255	91	91
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	250	0	0	484	1255	91	91
cSH	1700	1700	1700	1700	1700	1700	757	492	492
Volume to Capacity	0.25	0.25	0.15	0.34	0.34	0.28	1.66	0.19	0.19
Queue Length 95th (ft)	0	0	0	0	0	0	1728	17	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	317.5	14.0	14.0
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			317.5	14.0	
Approach LOS							F	B	

Intersection Summary			
Average Delay	96.3		
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1721	205	0	618	205	822	0	895	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1871	223	0	672	223	893	0	973	0	0	0
RTOR Reduction (vph)	0	0	106	0	0	106	0	0	9	0	0	0
Lane Group Flow (vph)	0	1871	117	0	672	117	446	447	964	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		57.7	57.7		57.7	57.7	41.5	41.5	41.5			
Effective Green, g (s)		57.7	57.7		57.7	57.7	41.5	41.5	41.5			
Actuated g/C Ratio		0.52	0.52		0.52	0.52	0.38	0.38	0.38			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2667	830		2667	830	634	634	1051			
v/s Ratio Prot		c0.37			0.13		0.27	0.27	c0.35			
v/s Ratio Perm			0.07			0.07						
v/c Ratio		0.70	0.14		0.25	0.14	0.70	0.71	0.92			
Uniform Delay, d1		19.7	13.4		14.3	13.4	29.0	29.1	32.6			
Progression Factor		0.91	0.68		0.88	1.34	1.00	1.00	1.00			
Incremental Delay, d2		1.6	0.4		0.2	0.3	3.5	3.6	12.3			
Delay (s)		19.4	9.4		12.9	18.3	32.6	32.6	44.9			
Level of Service		B	A		B	B	C	C	D			
Approach Delay (s)		18.3			14.2			39.0			0.0	
Approach LOS		B			B			D			A	

Intersection Summary				
HCM Average Control Delay	25.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
4: Clairemont Mesa Boulevard & Kearny Villa Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	1417	1037	146	614	12	146	81	132	39	89	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	1540	1127	159	667	13	159	88	143	42	97	150
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	61	0	0	63
Lane Group Flow (vph)	177	1540	1127	159	667	2	159	88	82	42	97	87
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	3.6	63.1	110.0	4.6	64.0	17.5	12.2	17.5	63.1	5.6	11.1	64.0
Effective Green, g (s)	3.6	63.1	110.0	4.6	64.0	17.5	12.2	17.5	63.1	5.6	11.1	64.0
Actuated g/C Ratio	0.03	0.57	1.00	0.04	0.58	0.16	0.11	0.16	0.57	0.05	0.10	0.58
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	112	2917	1583	74	2959	252	381	296	908	90	188	921
v/s Ratio Prot	0.05	0.30		c0.09	0.13		0.05	0.05		0.02	0.05	
v/s Ratio Perm			c0.71			0.00			0.05			0.06
v/c Ratio	1.58	0.53	0.71	2.15	0.23	0.01	0.42	0.30	0.09	0.47	0.52	0.09
Uniform Delay, d1	53.2	14.3	0.0	52.7	11.1	38.9	45.6	40.8	10.5	50.7	46.9	10.2
Progression Factor	0.90	0.58	1.00	0.59	1.48	0.89	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	285.5	0.4	1.7	557.8	0.2	0.0	0.7	0.6	0.2	3.8	2.4	0.2
Delay (s)	333.2	8.7	1.7	589.1	16.5	34.5	46.3	41.4	10.7	54.5	49.3	10.4
Level of Service	F	A	A	F	B	C	D	D	B	D	D	B
Approach Delay (s)		26.1			125.3			32.2			29.9	
Approach LOS		C			F			C			C	

Intersection Summary				
HCM Average Control Delay	46.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
5: Clairemont Mesa Boulevard & Complex Street

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	1086	100	68	675	95	45	4	83	51	1	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	5021		1770	4991			1780	1583		1776	1583
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	1770	5021		1770	4991			1863	1583		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	241	1180	109	74	734	103	49	4	90	55	1	37
RTOR Reduction (vph)	0	8	0	0	13	0	0	0	88	0	0	36
Lane Group Flow (vph)	241	1281	0	74	824	0	0	53	2	0	56	1
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	20.3	86.3		8.7	74.7			3.0	3.0		3.0	3.0
Effective Green, g (s)	20.3	86.3		8.7	74.7			3.0	3.0		3.0	3.0
Actuated g/C Ratio	0.18	0.78		0.08	0.68			0.03	0.03		0.03	0.03
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	327	3939		140	3389			51	43		51	43
v/s Ratio Prot	c0.14	c0.26		0.04	0.17							
v/s Ratio Perm								0.03	0.00		c0.03	0.00
v/c Ratio	0.74	0.33		0.53	0.24			1.04	0.06		1.10	0.02
Uniform Delay, d1	42.3	3.4		48.7	6.8			53.5	52.1		53.5	52.1
Progression Factor	1.43	0.13		1.36	0.02			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.6	0.2		3.0	0.1			137.6	0.6		155.9	0.2
Delay (s)	68.1	0.6		69.1	0.3			191.1	52.7		209.4	52.3
Level of Service	E	A		E	A			F	D		F	D
Approach Delay (s)		11.3			5.9			104.0			146.9	
Approach LOS		B			A			F			F	

Intersection Summary				
HCM Average Control Delay	19.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	47.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
6: Clairemont Mesa Boulevard & Overland Avenue

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	723	281	162	654	63	146	169	76	31	28	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4872		3433	5085	1583	1770	3374		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4872		3433	5085	1583	1770	3374		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	323	786	305	176	711	68	159	184	83	34	30	66
RTOR Reduction (vph)	0	56	0	0	0	52	0	44	0	0	0	42
Lane Group Flow (vph)	323	1035	0	176	711	16	159	223	0	34	30	24
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	13.8	26.9		11.0	24.0	24.0	13.7	49.6		3.8	39.7	39.7
Effective Green, g (s)	13.8	26.9		11.0	24.0	24.0	13.7	49.6		3.8	39.7	39.7
Actuated g/C Ratio	0.13	0.24		0.10	0.22	0.22	0.12	0.45		0.03	0.36	0.36
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	431	1191		343	1109	345	220	1521		61	672	571
v/s Ratio Prot	c0.09	c0.21		0.05	0.14		c0.09	c0.07		0.02	0.02	
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.75	0.87		0.51	0.64	0.05	0.72	0.15		0.56	0.04	0.04
Uniform Delay, d1	46.4	39.9		47.0	39.1	34.0	46.3	17.8		52.3	22.8	22.8
Progression Factor	0.73	1.07		0.82	1.44	3.03	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.7	8.4		1.0	2.3	0.2	11.1	0.0		10.6	0.1	0.1
Delay (s)	40.7	50.8		39.7	58.7	103.3	57.4	17.8		62.9	23.0	22.9
Level of Service	D	D		D	E	F	E	B		E	C	C
Approach Delay (s)		48.5			58.4			32.6			33.4	
Approach LOS		D			E			C			C	

Intersection Summary				
HCM Average Control Delay	48.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.8	
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
7: Clairemont Mesa Boulevard & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	355	347	176	464	687	369	109	239	73	184	482	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4829		3433	4819		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4829		3433	4819		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	377	191	504	747	401	118	260	79	200	524	153
RTOR Reduction (vph)	0	83	0	0	88	0	0	0	55	0	0	98
Lane Group Flow (vph)	386	485	0	504	1060	0	118	260	24	200	524	55
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	15.2	33.6		16.6	35.1		7.8	33.0	33.0	7.2	32.6	32.6
Effective Green, g (s)	15.2	33.6		16.6	35.1		7.8	33.0	33.0	7.2	32.6	32.6
Actuated g/C Ratio	0.14	0.31		0.15	0.32		0.07	0.30	0.30	0.07	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	474	1475		518	1538		243	1062	475	225	1049	469
v/s Ratio Prot	0.11	0.10		c0.15	c0.22		0.03	0.07		c0.06	c0.15	
v/s Ratio Perm									0.01			0.03
v/c Ratio	0.81	0.33		0.97	0.69		0.49	0.24	0.05	0.89	0.50	0.12
Uniform Delay, d1	46.0	29.5		46.5	32.7		49.2	29.1	27.4	51.0	32.0	28.2
Progression Factor	1.31	0.85		0.94	0.87		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.4		31.4	2.4		1.5	0.5	0.2	31.7	1.7	0.5
Delay (s)	67.6	25.4		75.3	31.0		50.7	29.6	27.6	82.7	33.7	28.7
Level of Service	E	C		E	C		D	C	C	F	C	C
Approach Delay (s)		42.4			44.5			34.7			44.0	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM Average Control Delay	42.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
8: Clairemont Mesa Boulevard & Project Access

2/15/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	641	64	321	1492	24	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	697	70	349	1622	26	130
RTOR Reduction (vph)	0	19	0	0	0	102
Lane Group Flow (vph)	697	51	349	1622	26	28
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	72.4	79.6	16.4	93.3	7.2	23.6
Effective Green, g (s)	72.4	79.6	16.4	93.3	7.2	23.6
Actuated g/C Ratio	0.66	0.72	0.15	0.85	0.07	0.21
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3347	1146	512	4313	116	709
v/s Ratio Prot	0.14	0.00	c0.10	c0.32	c0.01	0.01
v/s Ratio Perm		0.03				0.00
v/c Ratio	0.21	0.04	0.68	0.38	0.22	0.04
Uniform Delay, d1	7.4	4.3	44.3	1.9	48.8	34.2
Progression Factor	1.97	4.71	1.22	0.70	1.00	1.00
Incremental Delay, d2	0.1	0.0	3.6	0.2	1.0	0.0
Delay (s)	14.8	20.5	57.9	1.6	49.7	34.2
Level of Service	B	C	E	A	D	C
Approach Delay (s)	15.3			11.5	36.8	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	13.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	40.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	554	137	382	1310	160	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	602	149	415	1424	174	76
RTOR Reduction (vph)	0	0	44	0	0	0	20
Lane Group Flow (vph)	0	602	105	415	1424	174	56
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		47.7	47.7	30.7	83.4	16.2	46.9
Effective Green, g (s)		47.7	47.7	30.7	83.4	16.2	46.9
Actuated g/C Ratio		0.43	0.43	0.28	0.76	0.15	0.43
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1535	686	494	3855	261	675
v/s Ratio Prot		0.17		c0.23	c0.28	c0.10	0.02
v/s Ratio Perm			0.07				0.01
v/c Ratio		0.39	0.15	0.84	0.37	0.67	0.08
Uniform Delay, d1		21.3	18.9	37.3	4.5	44.3	18.8
Progression Factor		0.74	0.62	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.5	12.2	0.3	6.3	0.1
Delay (s)		16.4	12.1	49.5	4.7	50.6	18.8
Level of Service		B	B	D	A	D	B
Approach Delay (s)		15.6			14.8	41.0	
Approach LOS		B			B	D	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.7
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	331	293	462	1158	0	0	0	0	99	1	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1447	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1447	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	360	318	502	1259	0	0	0	0	108	1	700
RTOR Reduction (vph)	0	0	220	0	0	0	0	0	0	0	31	31
Lane Group Flow (vph)	0	360	98	502	1259	0	0	0	0	97	324	326
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		37.8	30.8	19.4	61.2					30.8	30.8	30.8
Effective Green, g (s)		37.8	30.8	19.4	61.2					30.8	30.8	30.8
Actuated g/C Ratio		0.38	0.31	0.19	0.61					0.31	0.31	0.31
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1338	858	666	2166					518	446	463
v/s Ratio Prot		0.10		c0.15	c0.36					0.06	c0.22	
v/s Ratio Perm			0.04									0.22
v/c Ratio		0.27	0.11	0.75	0.58					0.19	0.73	0.70
Uniform Delay, d1		21.5	24.8	38.0	11.7					25.4	30.8	30.6
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	4.8	1.1					0.2	5.8	4.8
Delay (s)		21.6	24.9	42.9	12.8					25.6	36.6	35.4
Level of Service		C	C	D	B					C	D	D
Approach Delay (s)		23.2			21.4			0.0			34.8	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	273	0	0	592	198	1028	0	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3406		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3406		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	297	0	0	643	215	1117	0	183	0	0	0
RTOR Reduction (vph)	0	0	0	0	39	0	0	0	112	0	0	0
Lane Group Flow (vph)	170	297	0	0	819	0	1117	0	71	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	7.1	39.1			27.8		30.9		30.9			
Effective Green, g (s)	7.1	39.1			27.8		30.9		30.9			
Actuated g/C Ratio	0.09	0.49			0.35		0.39		0.39			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	305	1730			1184		1326		611			
v/s Ratio Prot	c0.05	0.08			c0.24		c0.33					
v/s Ratio Perm									0.04			
v/c Ratio	0.56	0.17			0.69		0.84		0.12			
Uniform Delay, d1	34.9	11.4			22.4		22.3		15.8			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	2.2	0.2			3.3		5.0		0.1			
Delay (s)	37.1	11.6			25.7		27.4		15.9			
Level of Service	D	B			C		C		B			
Approach Delay (s)		20.9			25.7			25.8			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	24.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
12: Lightwave Avenue & Overland Avenue

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	128	52	104	207	240	50	128	35	131	304	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.92		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385		1770	3254		1770	3425		1770	3407	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3385		1770	3254		1770	3425		1770	3407	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	139	57	113	225	261	54	139	38	142	330	109
RTOR Reduction (vph)	0	45	0	0	206	0	0	27	0	0	34	0
Lane Group Flow (vph)	111	151	0	113	280	0	54	150	0	142	405	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.6	11.9		6.6	11.9		3.7	12.1		7.3	15.7	
Effective Green, g (s)	6.6	11.9		6.6	11.9		3.7	12.1		7.3	15.7	
Actuated g/C Ratio	0.12	0.21		0.12	0.21		0.07	0.21		0.13	0.28	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	207	713		207	685		116	733		229	947	
v/s Ratio Prot	0.06	0.04		c0.06	c0.09		0.03	0.04		c0.08	c0.12	
v/s Ratio Perm												
v/c Ratio	0.54	0.21		0.55	0.41		0.47	0.21		0.62	0.43	
Uniform Delay, d1	23.5	18.4		23.5	19.3		25.4	18.2		23.3	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.2		1.6	0.4		1.1	0.2		3.7	0.3	
Delay (s)	24.8	18.6		25.1	19.7		26.5	18.4		27.0	17.1	
Level of Service	C	B		C	B		C	B		C	B	
Approach Delay (s)		20.9			20.7			20.3			19.5	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	18.6	
Intersection Capacity Utilization	49.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
13: SR 52 WB Ramps & Kearny Villa Road

2/15/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	303	348	142	336	446	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3528	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	378	154	365	485	10
RTOR Reduction (vph)	0	223	0	0	1	0
Lane Group Flow (vph)	329	155	154	365	494	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.4	20.4	11.8	48.3	32.3	
Effective Green, g (s)	20.4	20.4	11.8	48.3	32.3	
Actuated g/C Ratio	0.25	0.25	0.15	0.60	0.40	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	451	404	261	2137	1424	
v/s Ratio Prot	c0.19		c0.09	0.10	c0.14	
v/s Ratio Perm		0.10				
v/c Ratio	0.73	0.38	0.59	0.17	0.35	
Uniform Delay, d1	27.3	24.6	31.8	7.0	16.5	
Progression Factor	1.00	1.00	1.11	0.99	1.00	
Incremental Delay, d2	5.8	0.6	3.5	0.2	0.7	
Delay (s)	33.1	25.2	39.0	7.1	17.2	
Level of Service	C	C	D	A	B	
Approach Delay (s)	28.9			16.6	17.2	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
14: EB Off-Ramp & Kearny Villa Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	0	527	0	0	0	0	372	56	51	734	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	0	573	0	0	0	0	404	61	55	798	0
RTOR Reduction (vph)	0	0	175	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	115	398	0	0	0	0	404	31	55	798	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		17.8	17.8					41.2	41.2	5.5	50.9	
Effective Green, g (s)		17.8	17.8					41.2	41.2	5.5	50.9	
Actuated g/C Ratio		0.22	0.22					0.52	0.52	0.07	0.64	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		394	620					1823	815	122	2252	
v/s Ratio Prot								0.11		0.03	c0.23	
v/s Ratio Perm		0.06	c0.14						0.02			
v/c Ratio		0.29	0.64					0.22	0.04	0.45	0.35	
Uniform Delay, d1		25.9	28.2					10.6	9.6	35.8	6.8	
Progression Factor		1.00	1.00					1.00	1.00	0.99	1.09	
Incremental Delay, d2		0.4	2.3					0.3	0.1	2.4	0.4	
Delay (s)		26.3	30.5					10.9	9.7	37.9	7.8	
Level of Service		C	C					B	A	D	A	
Approach Delay (s)		29.8			0.0			10.7			9.8	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
15: Kearny Villa Road & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	73	47	6	3	9	18	289	49	76	933	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.98		1.00	0.97	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1744	1583	1770	1648		1770	3463		3433	3426	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1744	1583	1770	1648		1770	3463		3433	3426	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	79	51	7	3	10	20	314	53	83	1014	275
RTOR Reduction (vph)	0	0	44	0	10	0	0	15	0	0	27	0
Lane Group Flow (vph)	108	111	7	7	3	0	20	352	0	83	1262	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.7	7.7	7.7	1.7	1.7		1.0	28.1		2.5	29.6	
Effective Green, g (s)	7.7	7.7	7.7	1.7	1.7		1.0	28.1		2.5	29.6	
Actuated g/C Ratio	0.14	0.14	0.14	0.03	0.03		0.02	0.50		0.04	0.53	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	240	218	54	50		32	1738		153	1811	
v/s Ratio Prot	c0.06	0.06		c0.00	0.00		0.01	0.10		c0.02	c0.37	
v/s Ratio Perm			0.00									
v/c Ratio	0.47	0.46	0.03	0.13	0.07		0.62	0.20		0.54	0.70	
Uniform Delay, d1	22.3	22.2	20.9	26.4	26.4		27.3	7.7		26.2	9.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	1.4	0.1	1.1	0.6		32.4	0.1		3.9	1.2	
Delay (s)	23.8	23.7	21.0	27.5	26.9		59.7	7.8		30.1	11.0	
Level of Service	C	C	C	C	C		E	A		C	B	
Approach Delay (s)		23.2			27.1			10.5			12.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	13.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
16: Chesapeake Drive & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	38	33	29	37	63	105	289	28	98	887	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1833	1583		1822	1583	1770	3493		1770	3483	
Flt Permitted		0.86	1.00		0.83	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607	1583		1542	1583	1770	3493		1770	3483	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	41	36	32	40	68	114	314	30	107	964	114
RTOR Reduction (vph)	0	0	33	0	0	61	0	6	0	0	8	0
Lane Group Flow (vph)	0	61	3	0	72	7	114	338	0	107	1070	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		5.0	5.0		5.6	5.6	5.7	27.6		6.0	27.9	
Effective Green, g (s)		5.0	5.0		5.6	5.6	5.7	27.6		6.0	27.9	
Actuated g/C Ratio		0.09	0.09		0.10	0.10	0.11	0.51		0.11	0.52	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		149	147		161	165	188	1792		197	1806	
v/s Ratio Prot							c0.06	0.10		0.06	c0.31	
v/s Ratio Perm		0.04	0.00		c0.05	0.00						
v/c Ratio		0.41	0.02		0.45	0.04	0.61	0.19		0.54	0.59	
Uniform Delay, d1		23.0	22.2		22.6	21.7	23.0	7.1		22.6	9.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0		0.7	0.0	3.8	0.1		1.6	0.7	
Delay (s)		23.7	22.2		23.4	21.7	26.7	7.1		24.2	9.6	
Level of Service		C	C		C	C	C	A		C	A	
Approach Delay (s)		23.1			22.6			12.0			11.0	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	12.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	21	2	0	0	41	356	5	6	747	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3532		1770	3493	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3532		1770	3493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	23	2	0	0	45	387	5	7	812	78
RTOR Reduction (vph)	0	22	0	0	0	0	0	1	0	0	4	0
Lane Group Flow (vph)	24	1	0	0	2	0	45	391	0	7	886	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.1	2.1			0.9		1.6	22.5		0.3	21.2	
Effective Green, g (s)	2.1	2.1			0.9		1.6	22.5		0.3	21.2	
Actuated g/C Ratio	0.05	0.05			0.02		0.04	0.50		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	82	73			35		121	1754		12	1635	
v/s Ratio Prot	c0.01	0.00			c0.00		c0.01	0.11		0.00	c0.25	
v/s Ratio Perm												
v/c Ratio	0.29	0.01			0.06		0.37	0.22		0.58	0.54	
Uniform Delay, d1	20.9	20.6			21.8		21.4	6.5		22.4	8.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.0			0.2		0.7	0.2		38.9	0.8	
Delay (s)	21.6	20.6			22.0		22.1	6.6		61.4	9.4	
Level of Service	C	C			C		C	A		E	A	
Approach Delay (s)		21.1			22.0			8.2			9.8	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	19.5
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	11	21	23	13	7	200	666	82	34	628	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799	1583		1805	1583	3433	3481		1770	3462	
Flt Permitted		0.93	1.00		0.89	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1726	1583		1652	1583	3433	3481		1770	3462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	12	23	25	14	8	217	724	89	37	683	116
RTOR Reduction (vph)	0	0	21	0	0	7	0	8	0	0	14	0
Lane Group Flow (vph)	0	42	2	0	39	1	217	805	0	37	785	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		3.7	3.7		3.7	3.7	6.7	28.2		1.4	22.9	
Effective Green, g (s)		3.7	3.7		3.7	3.7	6.7	28.2		1.4	22.9	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.14	0.59		0.03	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		133	122		128	122	480	2049		52	1655	
v/s Ratio Prot							c0.06	0.23		0.02	c0.23	
v/s Ratio Perm		c0.02	0.00		0.02	0.00						
v/c Ratio		0.32	0.01		0.30	0.01	0.45	0.39		0.71	0.47	
Uniform Delay, d1		20.9	20.4		20.9	20.4	18.9	5.3		23.0	8.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		0.5	0.0	0.2	0.3		31.6	0.6	
Delay (s)		21.4	20.4		21.4	20.4	19.2	5.6		54.6	9.0	
Level of Service		C	C		C	C	B	A		D	A	
Approach Delay (s)		21.1			21.2			8.5			11.0	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	14.6
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	17	404	47	0	1144
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	439	51	0	1243
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.88					
vC, conflicting volume	1061	220			490	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	806	220			490	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	283	784			1069	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	18	220	220	51	622	622
Volume Left	0	0	0	0	0	0
Volume Right	18	0	0	51	0	0
cSH	784	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.13	0.13	0.03	0.37	0.37
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.7	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	35.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	82	110	51	88	117	317	381	29	292	598	323
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1704		3433	3501		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1704		3433	3501		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	89	120	55	96	127	345	414	32	317	650	351
RTOR Reduction (vph)	0	0	71	0	50	0	0	5	0	0	0	215
Lane Group Flow (vph)	103	89	49	55	173	0	345	441	0	317	650	136
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	7.5	17.5	30.5	4.6	15.2		13.0	15.5		18.8	21.3	28.8
Effective Green, g (s)	7.5	17.5	30.5	4.6	15.2		13.0	15.5		18.8	21.3	28.8
Actuated g/C Ratio	0.10	0.23	0.41	0.06	0.20		0.17	0.21		0.25	0.29	0.39
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	346	438	648	109	348		599	728		447	1012	612
v/s Ratio Prot	0.03	c0.05	0.01	c0.03	c0.10		0.10	0.13		c0.18	c0.18	0.02
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.30	0.20	0.08	0.50	0.50		0.58	0.61		0.71	0.64	0.22
Uniform Delay, d1	31.1	22.9	13.4	33.8	26.3		28.2	26.7		25.4	23.3	15.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.1	3.6	1.1		1.3	1.4		5.1	1.4	0.2
Delay (s)	31.5	23.1	13.5	37.5	27.4		29.6	28.2		30.5	24.7	15.5
Level of Service	C	C	B	D	C		C	C		C	C	B
Approach Delay (s)		22.2			29.4			28.8			23.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.6	HCM Level of Service		C
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	74.5	Sum of lost time (s)		16.6
Intersection Capacity Utilization	57.3%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
21: Spectrum Center Boulevard & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	3	143	9	0	5	499	735	40	12	487	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3512		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3512		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	3	155	10	0	5	542	799	43	13	529	182
RTOR Reduction (vph)	0	0	107	0	0	5	0	2	0	0	0	97
Lane Group Flow (vph)	59	3	48	0	10	0	542	840	0	13	529	85
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	3.6	3.6	18.5		0.9	0.9	14.9	35.2		0.5	20.8	20.8
Effective Green, g (s)	3.6	3.6	18.5		0.9	0.9	14.9	35.2		0.5	20.8	20.8
Actuated g/C Ratio	0.06	0.06	0.31		0.01	0.01	0.25	0.58		0.01	0.34	0.34
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	205	111	486		26	24	848	2050		15	1221	546
v/s Ratio Prot	c0.02	0.00	0.02		c0.01		c0.16	c0.24		0.01	0.15	
v/s Ratio Perm			0.01			0.00						0.05
v/c Ratio	0.29	0.03	0.10		0.38	0.00	0.64	0.41		0.87	0.43	0.16
Uniform Delay, d1	27.1	26.7	14.9		29.4	29.3	20.3	6.9		29.9	15.2	13.7
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.1		9.2	0.1	1.6	0.1		162.9	0.2	0.1
Delay (s)	27.9	26.8	15.0		38.6	29.3	21.9	7.0		192.8	15.5	13.8
Level of Service	C	C	B		D	C	C	A		F	B	B
Approach Delay (s)		18.7			35.5			12.8			18.2	
Approach LOS		B			D			B			B	

Intersection Summary				
HCM Average Control Delay	15.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	60.3	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I AM (Year 2017)
22: Balboa Avenue & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	194	257	398	584	881	682	117	477	66	143	305	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4621		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4621		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	279	433	635	958	741	127	518	72	155	332	107
RTOR Reduction (vph)	0	197	0	0	0	153	0	0	56	0	0	87
Lane Group Flow (vph)	211	515	0	635	958	588	127	518	16	155	332	20
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	15.0	17.8		21.9	24.9	29.6	8.1	19.1	19.1	4.7	15.8	15.8
Effective Green, g (s)	15.0	17.8		21.9	24.9	29.6	8.1	19.1	19.1	4.7	15.8	15.8
Actuated g/C Ratio	0.18	0.21		0.26	0.30	0.35	0.10	0.23	0.23	0.06	0.19	0.19
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	316	979		461	1507	982	331	805	360	192	666	298
v/s Ratio Prot	0.12	0.11		c0.36	c0.19	0.03	0.04	c0.15		c0.05	0.09	
v/s Ratio Perm						0.18			0.01			0.01
v/c Ratio	0.67	0.53		1.38	0.64	0.60	0.38	0.64	0.05	0.81	0.50	0.07
Uniform Delay, d1	32.2	29.4		31.1	25.6	22.3	35.6	29.4	25.3	39.2	30.6	28.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	0.5		183.1	0.9	1.0	0.7	1.8	0.1	21.4	0.6	0.1
Delay (s)	37.4	29.9		214.1	26.5	23.3	36.4	31.1	25.4	60.6	31.1	28.1
Level of Service	D	C		F	C	C	D	C	C	E	C	C
Approach Delay (s)		31.6			76.5			31.5			38.3	
Approach LOS		C			E			C			D	

Intersection Summary				
HCM Average Control Delay	55.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	80.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Cuml+ Proj Ph I AM (Year 2017)
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	311	35	348	2110	486	17	16	35	90	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5008		1770	6228			1816	1583	1770	1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.84	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5008		1770	6228			1566	1583	1368	1651	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	338	38	378	2293	528	18	17	38	98	7	22
RTOR Reduction (vph)	0	8	0	0	24	0	0	0	34	0	20	0
Lane Group Flow (vph)	114	368	0	378	2797	0	0	35	4	98	9	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	9.1	40.4		22.5	54.8			9.9	9.9	9.9	9.9	
Effective Green, g (s)	9.1	40.4		22.5	54.8			9.9	9.9	9.9	9.9	
Actuated g/C Ratio	0.10	0.45		0.25	0.61			0.11	0.11	0.11	0.11	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	181	2268		446	3826			174	176	152	183	
v/s Ratio Prot	0.06	0.07		c0.21	c0.45						0.01	
v/s Ratio Perm								0.02	0.00	c0.07		
v/c Ratio	0.63	0.16		0.85	0.73			0.20	0.02	0.64	0.05	
Uniform Delay, d1	38.4	14.4		31.7	12.0			36.1	35.3	38.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	0.0		13.9	0.7			0.6	0.1	9.0	0.1	
Delay (s)	45.1	14.4		45.6	12.8			36.6	35.4	47.0	35.6	
Level of Service	D	B		D	B			D	D	D	D	
Approach Delay (s)		21.6			16.7			36.0			44.4	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM Average Control Delay	18.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Cuml+ Proj Ph I AM (Year 2017)
2/15/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	88	283	199	29	11	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	308	216	32	12	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	248				731	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	248				731	232
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				97	96
cM capacity (veh/h)	1318				361	807

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	96	308	248	48
Volume Left	96	0	0	12
Volume Right	0	0	32	36
cSH	1318	1700	1700	616
Volume to Capacity	0.07	0.18	0.15	0.08
Queue Length 95th (ft)	6	0	0	6
Control Delay (s)	7.9	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	1.9		0.0	11.3
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	222	129	18	7	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	241	140	20	8	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	160				430	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				430	150
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1419				574	896

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	20	241	160	15
Volume Left	20	0	0	8
Volume Right	0	0	20	8
cSH	1419	1700	1700	700
Volume to Capacity	0.01	0.14	0.09	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	7.6	0.0	0.0	10.3
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	10.3
Approach LOS				B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1588	58	200	1157	115	40	9	516	227	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5016		1770	1513	1504	3433	3137	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5016		1770	1513	1504	3433	3137	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1726	63	217	1258	125	43	10	561	247	16	50
RTOR Reduction (vph)	0	0	20	0	7	0	0	122	12	0	40	0
Lane Group Flow (vph)	54	1726	43	217	1376	0	43	163	274	247	26	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.0	71.5	76.1	12.2	76.1		6.3	18.5	30.7	13.6	26.1	
Effective Green, g (s)	7.0	71.5	76.1	12.2	76.1		6.3	18.5	30.7	13.6	26.1	
Actuated g/C Ratio	0.05	0.53	0.56	0.09	0.56		0.05	0.14	0.23	0.10	0.19	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	92	2693	892	310	2828		83	207	342	346	606	
v/s Ratio Prot	0.03	c0.34		0.06	0.27		0.02	0.11	c0.07	c0.07	0.01	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	0.59	0.64	0.05	0.70	0.49		0.52	0.79	0.80	0.71	0.04	
Uniform Delay, d1	62.6	22.6	13.2	59.6	17.7		62.9	56.4	49.3	58.8	44.3	
Progression Factor	1.00	1.00	1.00	0.99	0.76		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.0	1.2	0.0	5.3	0.2		2.3	16.6	11.9	5.7	0.0	
Delay (s)	68.6	23.8	13.2	64.4	13.6		65.1	73.0	61.2	64.5	44.3	
Level of Service	E	C	B	E	B		E	E	E	E	D	
Approach Delay (s)		24.7			20.5			66.9			60.3	
Approach LOS		C			C			E			E	

Intersection Summary				
HCM Average Control Delay	31.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1510	820	0	985	1035	0	0	405	0	0	382
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1641	891	0	1071	1125	0	0	440	0	0	415
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.89			0.76			0.81	0.81	0.76	0.81	0.81	0.89
vC, conflicting volume	2196			2533			2592	3837	821	2332	3603	535
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2101			2384			1914	3448	128	1593	3160	246
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	35	100	100	39
cM capacity (veh/h)	231			151			13	5	681	21	8	675

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	821	821	891	535	535	1125	440	208	208
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	891	0	0	1125	440	208	208
cSH	1700	1700	1700	1700	1700	1700	681	675	675
Volume to Capacity	0.48	0.48	0.52	0.31	0.31	0.66	0.65	0.31	0.31
Queue Length 95th (ft)	0	0	0	0	0	0	118	33	33
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	19.4	12.7	12.7
Lane LOS							C	B	B
Approach Delay (s)	0.0			0.0			19.4	12.7	
Approach LOS							C	B	

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1110	805	0	1790	684	215	0	400	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1207	875	0	1946	743	234	0	435	0	0	0
RTOR Reduction (vph)	0	0	260	0	0	116	0	0	5	0	0	0
Lane Group Flow (vph)	0	1207	615	0	1946	627	117	117	430	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		94.9	94.9		94.9	94.9	29.3	29.3	29.3			
Effective Green, g (s)		94.9	94.9		94.9	94.9	29.3	29.3	29.3			
Actuated g/C Ratio		0.70	0.70		0.70	0.70	0.22	0.22	0.22			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3575	1113		3575	1113	365	365	605			
v/s Ratio Prot		0.24			0.38		0.07	0.07	c0.15			
v/s Ratio Perm			0.39			c0.40						
v/c Ratio		0.34	0.55		0.54	0.56	0.32	0.32	0.71			
Uniform Delay, d1		7.8	9.7		9.6	9.9	44.5	44.5	48.9			
Progression Factor		1.37	6.81		0.81	1.11	1.00	1.00	1.00			
Incremental Delay, d2		0.2	1.7		0.4	1.4	0.5	0.5	3.8			
Delay (s)		10.9	68.1		8.2	12.3	45.0	45.0	52.7			
Level of Service		B	E		A	B	D	D	D			
Approach Delay (s)		35.0			9.3			50.0			0.0	
Approach LOS		C			A			D			A	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
4: Clairemont Mesa Boulevard & Kearny Villa Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	961	372	163	1709	24	509	122	222	39	114	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	1045	404	177	1858	26	553	133	241	42	124	297
RTOR Reduction (vph)	0	0	0	0	0	5	0	0	141	0	0	160
Lane Group Flow (vph)	191	1045	404	177	1858	21	553	133	100	42	124	137
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	12.2	55.8	135.0	18.7	62.2	33.8	26.4	33.8	55.8	7.5	15.1	62.2
Effective Green, g (s)	12.2	55.8	135.0	18.7	62.2	33.8	26.4	33.8	55.8	7.5	15.1	62.2
Actuated g/C Ratio	0.09	0.41	1.00	0.14	0.46	0.25	0.20	0.25	0.41	0.06	0.11	0.46
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	310	2102	1583	245	2343	396	671	466	654	98	208	729
v/s Ratio Prot	0.06	0.21		c0.10	c0.37		c0.16	0.07		0.02	c0.07	
v/s Ratio Perm			0.26			0.01			0.06			0.09
v/c Ratio	0.62	0.50	0.26	0.72	0.79	0.05	0.82	0.29	0.15	0.43	0.60	0.19
Uniform Delay, d1	59.1	29.2	0.0	55.7	30.9	38.4	52.1	40.9	24.8	61.7	57.0	21.5
Progression Factor	0.77	1.21	1.00	0.91	1.31	0.75	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.8	0.4	9.8	2.8	0.1	8.1	0.3	0.5	3.0	4.5	0.6
Delay (s)	48.9	36.1	0.4	60.2	43.3	28.9	60.2	41.2	25.3	64.7	61.6	22.1
Level of Service	D	D	A	E	D	C	E	D	C	E	E	C
Approach Delay (s)		28.8			44.6			48.4			36.5	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
5: Clairemont Mesa Boulevard & Complex Street

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1008	38	92	1134	41	93	4	49	76	5	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	5058		1770	5058			1777	1583		1779	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.57	1.00		0.51	1.00
Satd. Flow (perm)	1770	5058		1770	5058			1064	1583		946	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1096	41	100	1233	45	101	4	53	83	5	90
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	47	0	0	80
Lane Group Flow (vph)	109	1135	0	100	1276	0	0	105	6	0	88	10
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	13.6	95.4		12.9	94.7			14.7	14.7		14.7	14.7
Effective Green, g (s)	13.6	95.4		12.9	94.7			14.7	14.7		14.7	14.7
Actuated g/C Ratio	0.10	0.71		0.10	0.70			0.11	0.11		0.11	0.11
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	178	3574		169	3548			116	172		103	172
v/s Ratio Prot	c0.06	0.22		0.06	c0.25							
v/s Ratio Perm								c0.10	0.00		0.09	0.01
v/c Ratio	0.61	0.32		0.59	0.36			0.91	0.03		0.85	0.06
Uniform Delay, d1	58.2	7.5		58.5	8.0			59.5	53.8		59.1	53.9
Progression Factor	1.33	0.13		1.00	0.56			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.6	0.2		4.6	0.2			54.6	0.1		45.8	0.1
Delay (s)	82.9	1.2		63.3	4.7			114.0	53.9		104.9	54.1
Level of Service	F	A		E	A			F	D		F	D
Approach Delay (s)		8.3			9.0			93.9			79.2	
Approach LOS		A			A			F			E	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
6: Clairemont Mesa Boulevard & Overland Avenue

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	937	169	201	853	34	203	87	164	77	151	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4969		3433	5085	1583	1770	3193		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4969		3433	5085	1583	1770	3193		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	1018	184	218	927	37	221	95	178	84	164	320
RTOR Reduction (vph)	0	19	0	0	0	17	0	112	0	0	0	165
Lane Group Flow (vph)	147	1183	0	218	927	20	221	161	0	84	164	155
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	10.0	44.2		12.8	46.9	46.9	20.6	49.7		9.6	38.7	38.7
Effective Green, g (s)	10.0	44.2		12.8	46.9	46.9	20.6	49.7		9.6	38.7	38.7
Actuated g/C Ratio	0.07	0.33		0.09	0.35	0.35	0.15	0.37		0.07	0.29	0.29
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	254	1627		325	1767	550	270	1175		126	534	454
v/s Ratio Prot	0.04	c0.24		c0.06	c0.18		c0.12	0.05		0.05	0.09	
v/s Ratio Perm						0.01						c0.10
v/c Ratio	0.58	0.73		0.67	0.52	0.04	0.82	0.14		0.67	0.31	0.34
Uniform Delay, d1	60.5	40.1		59.1	35.2	29.1	55.4	28.4		61.1	37.7	38.1
Progression Factor	0.96	1.37		1.10	1.16	1.70	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	2.8		4.5	0.9	0.1	17.3	0.1		12.5	1.5	2.0
Delay (s)	61.2	57.7		69.3	41.6	49.7	72.7	28.4		73.7	39.1	40.1
Level of Service	E	E		E	D	D	E	C		E	D	D
Approach Delay (s)		58.0			47.0			48.2			44.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	51.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
7: Clairemont Mesa Boulevard & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	318	909	146	233	504	159	292	563	205	561	452	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4980		3433	4902		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4980		3433	4902		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	346	988	159	253	548	173	317	612	223	610	491	316
RTOR Reduction (vph)	0	16	0	0	41	0	0	0	149	0	0	165
Lane Group Flow (vph)	346	1131	0	253	680	0	317	612	74	610	491	151
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	17.8	34.3		13.1	29.7		17.7	38.9	38.9	29.1	50.5	50.5
Effective Green, g (s)	17.8	34.3		13.1	29.7		17.7	38.9	38.9	29.1	50.5	50.5
Actuated g/C Ratio	0.13	0.25		0.10	0.22		0.13	0.29	0.29	0.22	0.37	0.37
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	453	1265		333	1078		450	1020	456	740	1324	592
v/s Ratio Prot	c0.10	c0.23		0.07	0.14		0.09	c0.17		c0.18	0.14	
v/s Ratio Perm									0.05			0.10
v/c Ratio	0.76	0.89		0.76	0.63		0.70	0.60	0.16	0.82	0.37	0.26
Uniform Delay, d1	56.6	48.6		59.4	47.7		56.1	41.4	35.9	50.5	30.7	29.2
Progression Factor	1.11	1.65		0.97	0.81		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	8.5		9.5	2.8		5.0	2.6	0.8	7.4	0.8	1.0
Delay (s)	69.3	88.7		67.1	41.6		61.1	44.0	36.6	57.9	31.5	30.3
Level of Service	E	F		E	D		E	D	D	E	C	C
Approach Delay (s)		84.2			48.2			47.3			42.6	
Approach LOS		F			D			D			D	

Intersection Summary				
HCM Average Control Delay	57.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.4	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
8: Clairemont Mesa Boulevard & Project Access

3/25/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1725	34	168	818	78	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1875	37	183	889	85	425
RTOR Reduction (vph)	0	8	0	0	0	11
Lane Group Flow (vph)	1875	29	183	889	85	414
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	95.4	107.3	13.7	113.6	11.9	25.6
Effective Green, g (s)	95.4	107.3	13.7	113.6	11.9	25.6
Actuated g/C Ratio	0.71	0.79	0.10	0.84	0.09	0.19
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3593	1258	348	4279	156	619
v/s Ratio Prot	c0.37	0.00	0.05	0.17	0.05	c0.07
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.52	0.02	0.53	0.21	0.54	0.67
Uniform Delay, d1	9.2	2.9	57.6	2.1	59.0	50.8
Progression Factor	0.43	0.02	1.10	0.77	1.00	1.00
Incremental Delay, d2	0.4	0.0	1.4	0.1	3.9	2.8
Delay (s)	4.3	0.1	64.5	1.7	62.8	53.5
Level of Service	A	A	E	A	E	D
Approach Delay (s)	4.2			12.4	55.1	
Approach LOS	A			B	E	

Intersection Summary				
HCM Average Control Delay	14.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	55.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1492	202	194	731	164	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1622	220	211	795	178	460
RTOR Reduction (vph)	0	0	22	0	0	0	8
Lane Group Flow (vph)	0	1622	198	211	795	178	452
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		77.3	77.3	23.4	105.7	18.9	42.3
Effective Green, g (s)		77.3	77.3	23.4	105.7	18.9	42.3
Actuated g/C Ratio		0.57	0.57	0.17	0.78	0.14	0.31
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2026	906	307	3981	248	496
v/s Ratio Prot		c0.46		0.12	0.16	0.10	c0.16
v/s Ratio Perm			0.12				0.13
v/c Ratio		0.80	0.22	0.69	0.20	0.72	0.91
Uniform Delay, d1		22.8	14.1	52.4	3.8	55.5	44.5
Progression Factor		0.88	0.96	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.9	0.5	6.3	0.1	9.5	20.9
Delay (s)		23.0	14.1	58.6	3.9	65.0	65.4
Level of Service		C	B	E	A	E	E
Approach Delay (s)		21.9			15.4	65.3	
Approach LOS		C			B	E	

Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1269	646	207	738	0	0	0	0	777	7	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1606	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1606	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1379	702	225	802	0	0	0	0	845	8	255
RTOR Reduction (vph)	0	0	375	0	0	0	0	0	0	0	3	105
Lane Group Flow (vph)	0	1379	327	225	802	0	0	0	0	439	437	124
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		37.3	37.3	7.2	48.5					23.5	23.5	23.5
Effective Green, g (s)		37.3	37.3	7.2	48.5					23.5	23.5	23.5
Actuated g/C Ratio		0.47	0.47	0.09	0.61					0.29	0.29	0.29
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1650	1299	309	2146					494	472	442
v/s Ratio Prot		c0.39		c0.07	0.23					0.26	c0.27	
v/s Ratio Perm			0.12									0.08
v/c Ratio		0.84	0.25	0.73	0.37					0.89	0.93	0.28
Uniform Delay, d1		18.7	12.9	35.4	8.0					27.0	27.4	21.7
Progression Factor		1.00	1.00	1.28	0.77					1.00	1.00	1.00
Incremental Delay, d2		3.8	0.1	7.1	0.4					17.4	24.2	0.3
Delay (s)		22.5	13.0	52.5	6.6					44.4	51.6	22.1
Level of Service		C	B	D	A					D	D	C
Approach Delay (s)		19.3			16.7			0.0			42.6	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	558	1488	0	0	539	86	406	0	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3467		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3467		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	607	1617	0	0	586	93	441	0	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	33	0	0	0
Lane Group Flow (vph)	607	1617	0	0	665	0	441	0	160	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	19.0	55.1			31.9		14.9		14.9			
Effective Green, g (s)	19.0	55.1			31.9		14.9		14.9			
Actuated g/C Ratio	0.24	0.69			0.40		0.19		0.19			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	815	2437			1382		639		295			
v/s Ratio Prot	c0.18	c0.46			0.19		c0.13					
v/s Ratio Perm									0.10			
v/c Ratio	0.74	0.66			0.48		0.69		0.54			
Uniform Delay, d1	28.3	7.1			17.9		30.4		29.5			
Progression Factor	0.96	1.71			1.00		1.00		1.00			
Incremental Delay, d2	1.8	0.7			1.2		3.2		2.0			
Delay (s)	28.9	12.9			19.1		33.6		31.5			
Level of Service	C	B			B		C		C			
Approach Delay (s)		17.3			19.1			33.0			0.0	
Approach LOS		B			B			C			A	

Intersection Summary				
HCM Average Control Delay	20.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2	
Intersection Capacity Utilization	88.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
12: Lightwave Avenue & Overland Avenue

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	172	80	69	188	211	86	176	107	286	189	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3371		1770	3258		1770	3339		1770	3366	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3371		1770	3258		1770	3339		1770	3366	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	187	87	75	204	229	93	191	116	311	205	99
RTOR Reduction (vph)	0	64	0	0	189	0	0	95	0	0	58	0
Lane Group Flow (vph)	142	210	0	75	244	0	93	212	0	311	246	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.7	12.4		5.8	10.5		6.4	10.9		13.1	17.6	
Effective Green, g (s)	7.7	12.4		5.8	10.5		6.4	10.9		13.1	17.6	
Actuated g/C Ratio	0.13	0.20		0.10	0.17		0.11	0.18		0.22	0.29	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	224	688		169	563		186	599		381	974	
v/s Ratio Prot	c0.08	0.06		0.04	c0.07		0.05	c0.06		c0.18	0.07	
v/s Ratio Perm												
v/c Ratio	0.63	0.30		0.44	0.43		0.50	0.35		0.82	0.25	
Uniform Delay, d1	25.2	20.5		26.0	22.5		25.7	21.9		22.7	16.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.3		0.7	0.6		0.8	0.4		12.1	0.2	
Delay (s)	29.5	20.8		26.7	23.1		26.5	22.3		34.8	16.7	
Level of Service	C	C		C	C		C	C		C	B	
Approach Delay (s)		23.8			23.6			23.2			25.8	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	18.6	
Intersection Capacity Utilization	58.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	77	576	1062	780	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3527	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	84	626	1154	848	20
RTOR Reduction (vph)	0	75	0	0	1	0
Lane Group Flow (vph)	88	9	626	1154	867	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	10.3	10.3	39.4	78.4	34.8	
Effective Green, g (s)	10.3	10.3	39.4	78.4	34.8	
Actuated g/C Ratio	0.10	0.10	0.39	0.78	0.35	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	182	163	697	2775	1227	
v/s Ratio Prot	c0.05		c0.35	0.33	c0.25	
v/s Ratio Perm		0.01				
v/c Ratio	0.48	0.05	0.90	0.42	0.71	
Uniform Delay, d1	42.3	40.5	28.4	3.5	28.2	
Progression Factor	1.00	1.00	0.91	3.24	1.00	
Incremental Delay, d2	2.0	0.1	1.6	0.0	3.4	
Delay (s)	44.4	40.6	27.6	11.2	31.6	
Level of Service	D	D	C	B	C	
Approach Delay (s)	42.5			17.0	31.6	
Approach LOS	D			B	C	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	5	221	0	0	0	0	1481	394	415	441	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1776	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1776	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	5	240	0	0	0	0	1610	428	451	479	0
RTOR Reduction (vph)	0	0	207	0	0	0	0	0	200	0	0	0
Lane Group Flow (vph)	0	175	33	0	0	0	0	1610	228	451	479	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		13.8	13.8					43.7	43.7	27.0	74.9	
Effective Green, g (s)		13.8	13.8					43.7	43.7	27.0	74.9	
Actuated g/C Ratio		0.14	0.14					0.44	0.44	0.27	0.75	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		245	385					1547	692	478	2651	
v/s Ratio Prot								c0.45		c0.25	0.14	
v/s Ratio Perm		0.10	0.01						0.14			
v/c Ratio		0.71	0.09					1.04	0.33	0.94	0.18	
Uniform Delay, d1		41.2	37.6					28.1	18.5	35.8	3.6	
Progression Factor		1.00	1.00					1.00	1.00	1.48	0.53	
Incremental Delay, d2		9.5	0.1					34.2	1.3	22.4	0.1	
Delay (s)		50.7	37.7					62.4	19.8	75.3	2.1	
Level of Service		D	D					E	B	E	A	
Approach Delay (s)		43.2			0.0			53.4			37.6	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM Average Control Delay	47.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
15: Kearny Villa Road & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	379	4	22	43	32	82	29	1411	4	14	542	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1687	1583	1770	1662		1770	3538		3433	3452	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1687	1583	1770	1662		1770	3538		3433	3452	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	412	4	24	47	35	89	32	1534	4	15	589	115
RTOR Reduction (vph)	0	0	20	0	83	0	0	0	0	0	19	0
Lane Group Flow (vph)	206	210	4	47	41	0	32	1538	0	15	685	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.0	13.0	13.0	5.0	5.0		1.7	35.3		0.7	34.3	
Effective Green, g (s)	13.0	13.0	13.0	5.0	5.0		1.7	35.3		0.7	34.3	
Actuated g/C Ratio	0.19	0.19	0.19	0.07	0.07		0.02	0.50		0.01	0.49	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	312	313	294	126	119		43	1784		34	1691	
v/s Ratio Prot	0.12	c0.12		c0.03	0.02		c0.02	c0.43		0.00	0.20	
v/s Ratio Perm			0.00									
v/c Ratio	0.66	0.67	0.02	0.37	0.35		0.74	0.86		0.44	0.41	
Uniform Delay, d1	26.5	26.5	23.3	31.0	30.9		33.9	15.2		34.5	11.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	5.6	0.0	1.9	1.8		50.5	4.6		8.9	0.2	
Delay (s)	31.6	32.1	23.3	32.9	32.7		84.4	19.8		43.3	11.5	
Level of Service	C	C	C	C	C		F	B		D	B	
Approach Delay (s)		31.4			32.8			21.1			12.2	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
16: Chesapeake Drive & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	20	152	98	55	167	67	1060	35	37	553	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1789	1583		1805	1583	1770	3522		1770	3496	
Flt Permitted		0.65	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1220	1583		1365	1583	1770	3522		1770	3496	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	22	165	107	60	182	73	1152	38	40	601	53
RTOR Reduction (vph)	0	0	133	0	0	109	0	2	0	0	6	0
Lane Group Flow (vph)	0	124	32	0	167	73	73	1188	0	40	648	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		11.3	11.3		11.9	11.9	4.1	30.4		1.8	28.1	
Effective Green, g (s)		11.3	11.3		11.9	11.9	4.1	30.4		1.8	28.1	
Actuated g/C Ratio		0.19	0.19		0.20	0.20	0.07	0.52		0.03	0.48	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		235	305		277	321	124	1824		54	1674	
v/s Ratio Prot							c0.04	c0.34		0.02	0.19	
v/s Ratio Perm		0.10	0.02		c0.12	0.05						
v/c Ratio		0.53	0.10		0.60	0.23	0.59	0.65		0.74	0.39	
Uniform Delay, d1		21.3	19.5		21.3	19.6	26.5	10.3		28.2	9.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0	0.1		2.5	0.1	4.5	1.0		37.5	0.2	
Delay (s)		22.3	19.6		23.8	19.7	31.0	11.3		65.7	10.0	
Level of Service		C	B		C	B	C	B		E	B	
Approach Delay (s)		20.7			21.6			12.4			13.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
17: Hazard Way & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	0	36	8	0	9	13	891	2	1	717	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1690		3433	3538		1770	3533	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1690		3433	3538		1770	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	39	9	0	10	14	968	2	1	779	9
RTOR Reduction (vph)	0	35	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	83	4	0	0	9	0	14	970	0	1	787	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Effective Green, g (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Actuated g/C Ratio	0.11	0.11			0.02		0.01	0.47		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	202	181			30		34	1678		17	1676	
v/s Ratio Prot	c0.05	0.00			c0.01		c0.00	c0.27		0.00	0.22	
v/s Ratio Perm												
v/c Ratio	0.41	0.02			0.31		0.41	0.58		0.06	0.47	
Uniform Delay, d1	20.9	20.0			24.6		25.0	9.7		24.9	9.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			2.1		2.9	0.9		0.5	0.5	
Delay (s)	21.4	20.0			26.7		27.9	10.6		25.4	9.6	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		21.0			26.7			10.8			9.6	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	19.5
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
18: Farnham St & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	6	150	151	30	66	70	761	23	4	974	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1777	1583		1788	1583	3433	3524		1770	3514	
Flt Permitted		0.58	1.00		0.65	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1082	1583		1207	1583	3433	3524		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	7	163	164	33	72	76	827	25	4	1059	53
RTOR Reduction (vph)	0	0	125	0	0	55	0	2	0	0	4	0
Lane Group Flow (vph)	0	174	38	0	197	17	76	850	0	4	1108	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		13.2	13.2		13.2	13.2	2.2	28.1		0.7	26.6	
Effective Green, g (s)		13.2	13.2		13.2	13.2	2.2	28.1		0.7	26.6	
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.04	0.50		0.01	0.47	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		252	369		281	369	133	1750		22	1651	
v/s Ratio Prot							c0.02	0.24		0.00	c0.32	
v/s Ratio Perm		0.16	0.02		c0.16	0.01						
v/c Ratio		0.69	0.10		0.70	0.05	0.57	0.49		0.18	0.67	
Uniform Delay, d1		19.8	17.0		19.9	16.8	26.7	9.5		27.7	11.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.4	0.0		6.3	0.0	3.6	0.6		1.4	1.6	
Delay (s)		26.3	17.1		26.2	16.8	30.4	10.0		29.1	13.2	
Level of Service		C	B		C	B	C	B		C	B	
Approach Delay (s)		21.8			23.7			11.7			13.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	85	1003	24	0	943
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	92	1090	26	0	1025
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.87	0.82			0.82	
vC, conflicting volume	1603	545			1116	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	893	4			701	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	90			100	
cM capacity (veh/h)	244	883			731	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	92	545	545	26	512	512
Volume Left	0	0	0	0	0	0
Volume Right	92	0	0	26	0	0
cSH	883	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.32	0.32	0.02	0.30	0.30
Queue Length 95th (ft)	9	0	0	0	0	0
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.6	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		39.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	205	78	292	104	140	249	238	724	42	135	658	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1684		3433	3510		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1684		3433	3510		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	85	317	113	152	271	259	787	46	147	715	201
RTOR Reduction (vph)	0	0	61	0	61	0	0	4	0	0	0	120
Lane Group Flow (vph)	223	85	256	113	362	0	259	829	0	147	715	81
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	9.8	26.6	38.9	8.4	25.8		12.3	28.1		12.1	27.9	37.7
Effective Green, g (s)	9.8	26.6	38.9	8.4	25.8		12.3	28.1		12.1	27.9	37.7
Actuated g/C Ratio	0.11	0.29	0.42	0.09	0.28		0.13	0.30		0.13	0.30	0.40
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	361	531	660	159	466		453	1057		230	1058	640
v/s Ratio Prot	c0.06	0.05	0.05	0.06	c0.22		0.08	c0.24		c0.08	0.20	0.01
v/s Ratio Perm			0.11									0.04
v/c Ratio	0.62	0.16	0.39	0.71	0.78		0.57	0.78		0.64	0.68	0.13
Uniform Delay, d1	40.0	25.0	18.9	41.3	31.1		38.0	29.8		38.5	28.7	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	0.1	0.4	13.9	8.0		1.7	3.9		5.7	1.7	0.1
Delay (s)	43.1	25.1	19.3	55.2	39.1		39.8	33.7		44.3	30.5	17.6
Level of Service	D	C	B	E	D		D	C		D	C	B
Approach Delay (s)		28.6			42.5			35.1			29.9	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay		33.4	HCM Level of Service	C
HCM Volume to Capacity ratio		0.69		
Actuated Cycle Length (s)		93.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization		71.9%	ICU Level of Service	C
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
21: Spectrum Center Boulevard & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	0	567	16	4	16	237	683	4	15	942	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Flt Permitted	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	0	616	17	4	17	258	742	4	16	1024	77
RTOR Reduction (vph)	0	0	189	0	0	16	0	0	0	0	0	23
Lane Group Flow (vph)	170	0	427	0	21	1	258	746	0	16	1024	54
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	9.4		19.5		3.7	3.7	10.1	42.8		0.6	33.3	33.3
Effective Green, g (s)	9.4		19.5		3.7	3.7	10.1	42.8		0.6	33.3	33.3
Actuated g/C Ratio	0.12		0.25		0.05	0.05	0.13	0.56		0.01	0.43	0.43
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	421		403		86	76	453	1976		14	1538	688
v/s Ratio Prot	0.05		c0.14		c0.01		0.08	0.21		0.01	c0.29	
v/s Ratio Perm			0.13			0.00						0.03
v/c Ratio	0.40		1.06		0.24	0.01	0.57	0.38		1.14	0.67	0.08
Uniform Delay, d1	31.0		28.5		35.1	34.7	31.2	9.4		38.0	17.2	12.7
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6		61.2		1.5	0.1	1.6	0.1		291.3	1.1	0.0
Delay (s)	31.6		89.7		36.6	34.8	32.9	9.6		329.3	18.3	12.7
Level of Service	C		F		D	C	C	A		F	B	B
Approach Delay (s)		77.2			35.8			15.6			22.4	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	19.2
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Proj Ph I PM (Year 2017)
22: Balboa Avenue & Ruffin Road

3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	918	167	109	503	324	430	521	361	685	651	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	998	182	118	547	352	467	566	392	745	708	250
RTOR Reduction (vph)	0	21	0	0	0	96	0	0	106	0	0	140
Lane Group Flow (vph)	160	1159	0	118	547	256	467	566	286	745	708	110
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	7.7	31.3		9.6	33.4	50.8	18.7	31.0	31.0	17.4	29.8	29.8
Effective Green, g (s)	7.7	31.3		9.6	33.4	50.8	18.7	31.0	31.0	17.4	29.8	29.8
Actuated g/C Ratio	0.07	0.29		0.09	0.30	0.46	0.17	0.28	0.28	0.16	0.27	0.27
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	124	1416		155	1547	1289	585	999	447	544	960	430
v/s Ratio Prot	c0.09	c0.23		0.07	0.11	0.03	0.14	0.16		c0.22	c0.20	
v/s Ratio Perm						0.06			0.18			0.07
v/c Ratio	1.29	0.82		0.76	0.35	0.20	0.80	0.57	0.64	1.37	0.74	0.26
Uniform Delay, d1	51.0	36.6		49.0	29.8	17.5	43.7	33.7	34.5	46.2	36.4	31.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	178.0	3.8		19.6	0.1	0.1	7.5	0.7	3.0	177.7	3.0	0.3
Delay (s)	229.0	40.4		68.5	29.9	17.5	51.2	34.4	37.5	223.9	39.4	31.6
Level of Service	F	D		E	C	B	D	C	D	F	D	C
Approach Delay (s)		62.9			30.1			40.8			119.0	
Approach LOS		E			C			D			F	

Intersection Summary			
HCM Average Control Delay	68.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	20.4
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Cuml+ Proj Ph I PM (Year 2017)
3/25/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1970	36	47	806	74	33	7	484	466	15	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5072		1770	6327			1790	1583	1770	1619	
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5072		1770	6327			1434	1583	1357	1619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	2141	39	51	876	80	36	8	526	507	16	109
RTOR Reduction (vph)	0	2	0	0	12	0	0	0	62	0	67	0
Lane Group Flow (vph)	48	2178	0	51	944	0	0	44	464	507	58	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	6.5	52.5		3.7	50.7			45.4	45.4	45.4	45.4	
Effective Green, g (s)	6.5	52.5		3.7	50.7			45.4	45.4	45.4	45.4	
Actuated g/C Ratio	0.06	0.44		0.03	0.43			0.38	0.38	0.38	0.38	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	98	2257		56	2718			552	609	522	623	
v/s Ratio Prot	0.03	c0.43		c0.03	0.15						0.04	
v/s Ratio Perm								0.03	0.29	c0.37		
v/c Ratio	0.49	0.97		0.91	0.35			0.08	0.76	0.97	0.09	
Uniform Delay, d1	54.1	31.9		57.0	22.6			23.0	31.6	35.7	23.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	11.8		88.0	0.1			0.1	5.6	32.0	0.1	
Delay (s)	58.0	43.7		145.0	22.6			23.1	37.2	67.6	23.2	
Level of Service	E	D		F	C			C	D	E	C	
Approach Delay (s)		44.0			28.8			36.1			58.8	
Approach LOS		D			C			D			E	

Intersection Summary				
HCM Average Control Delay	41.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	118.0	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	108.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Cuml+ Proj Ph I PM (Year 2017)
3/25/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	46	174	246	15	36	107
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	189	267	16	39	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	284				565	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				565	276
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	85
cM capacity (veh/h)	1279				467	763

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	50	189	284	155
Volume Left	50	0	0	39
Volume Right	0	0	16	116
cSH	1279	1700	1700	658
Volume to Capacity	0.04	0.11	0.17	0.24
Queue Length 95th (ft)	3	0	0	23
Control Delay (s)	7.9	0.0	0.0	12.2
Lane LOS	A			B
Approach Delay (s)	1.7		0.0	12.2
Approach LOS				B

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	159	210	9	21	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	173	228	10	23	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	238				426	233
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	238				426	233
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	1329				581	806

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	10	173	238	46
Volume Left	10	0	0	23
Volume Right	0	0	10	23
cSH	1329	1700	1700	675
Volume to Capacity	0.01	0.10	0.14	0.07
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	7.7	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	0.4		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

ILV ANALYSIS WORKSHEETS

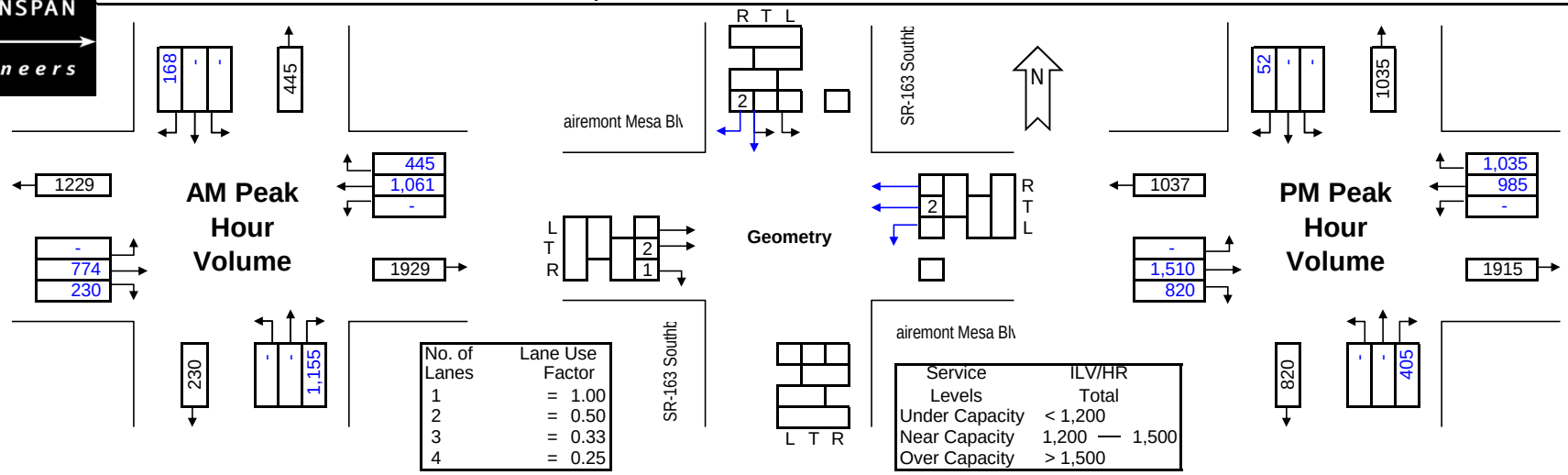
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



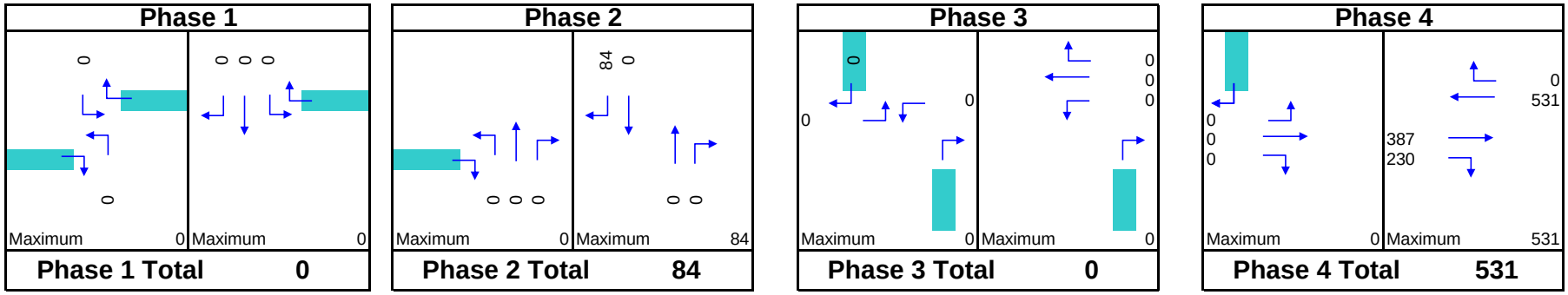
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 615

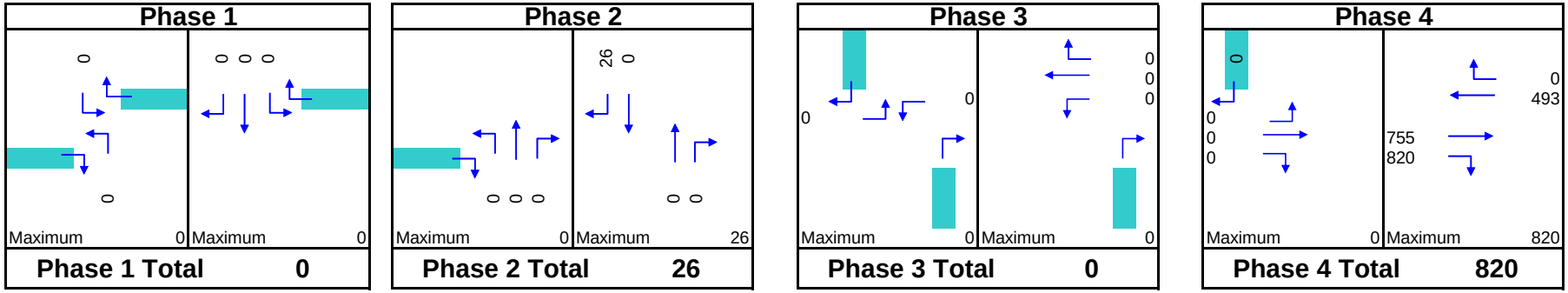
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 846

Service Level: **Under Capacity**



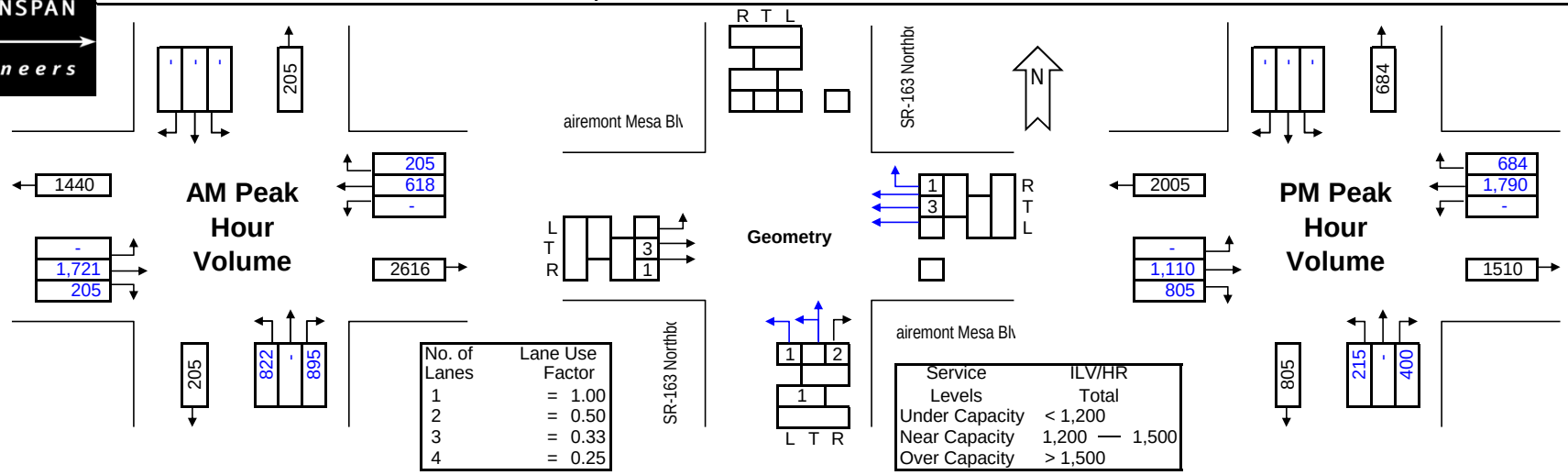
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



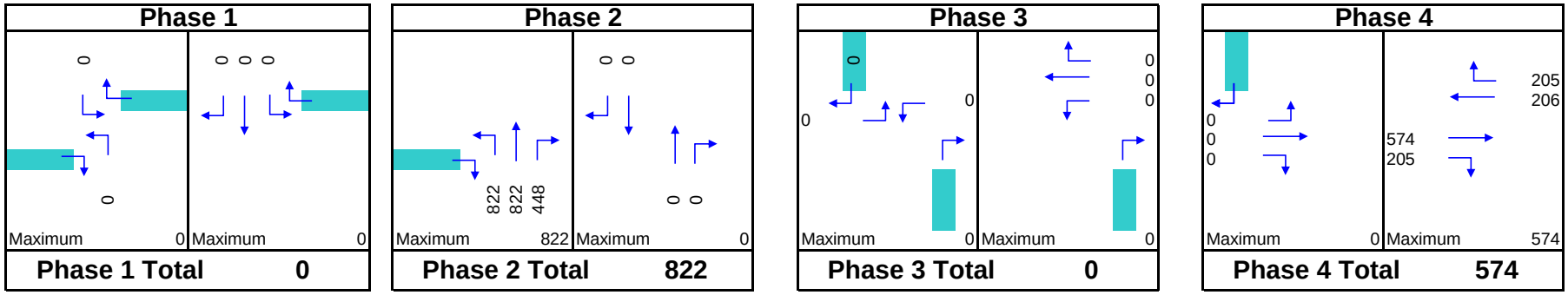
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1396

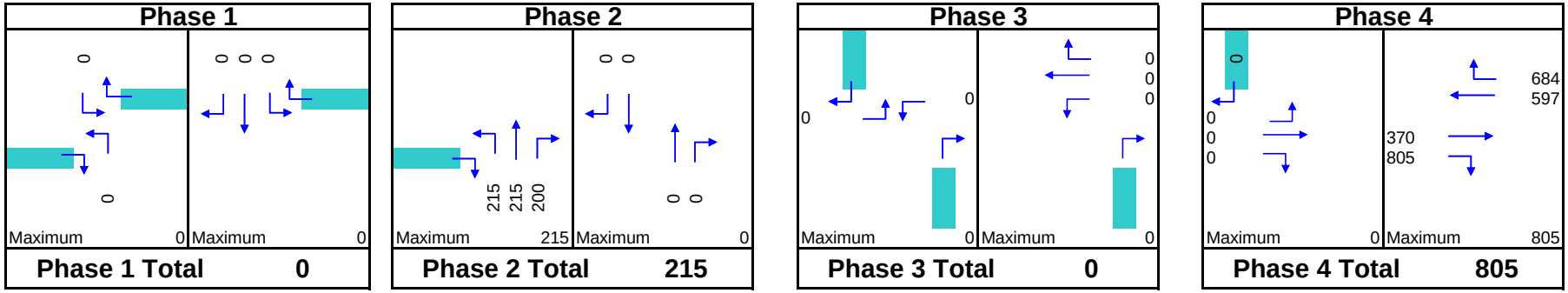
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1020

Service Level: **Under Capacity**



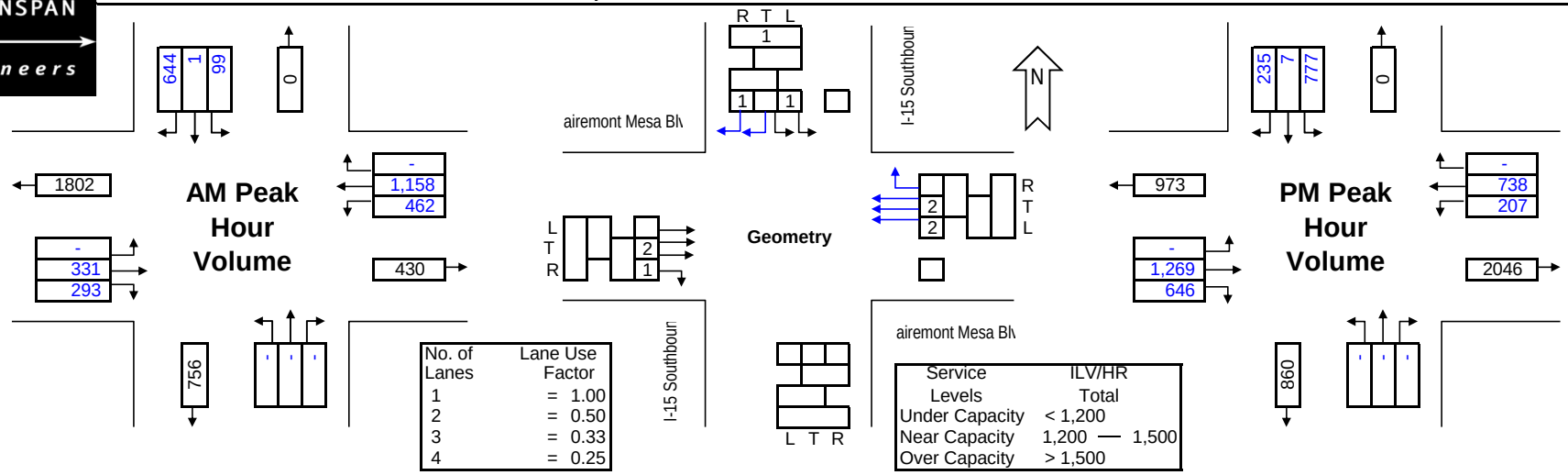
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W

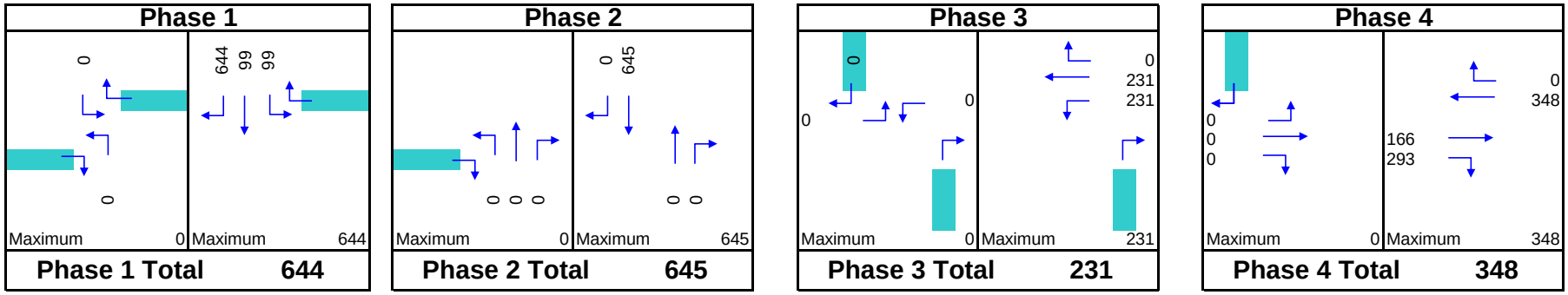


No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

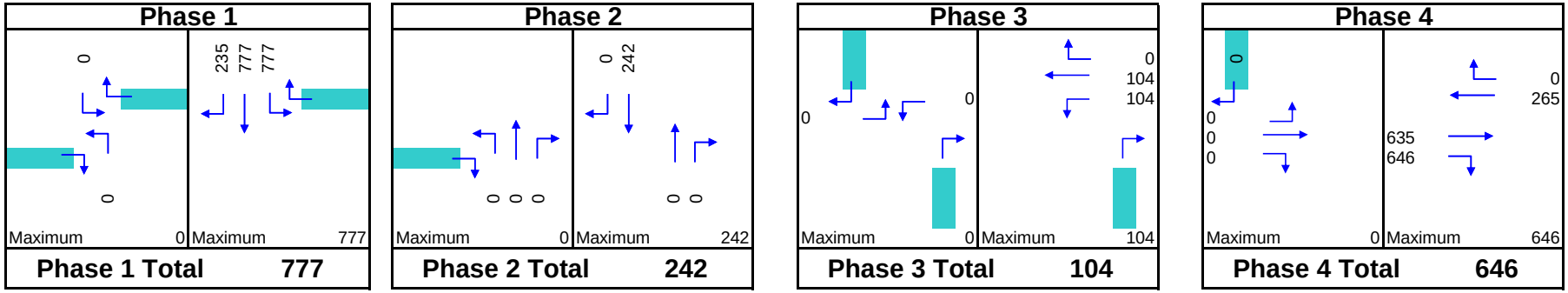
AM Peak Hour Analysis

Total Crictical Lane Volume 1868 — Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1769 — Service Level: **Over Capacity**



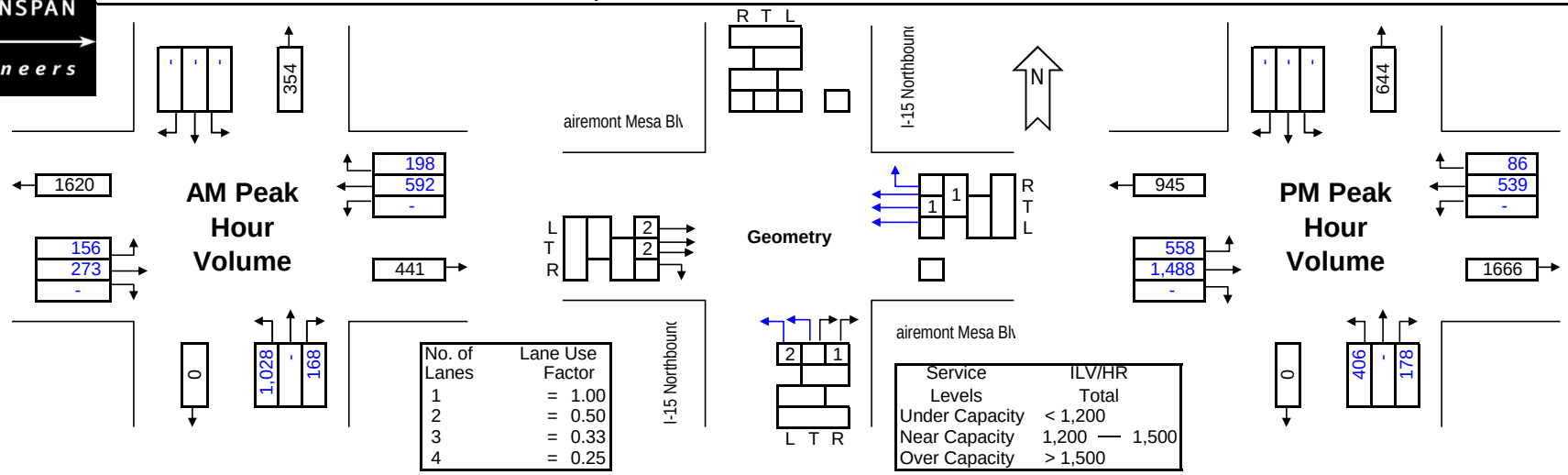
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



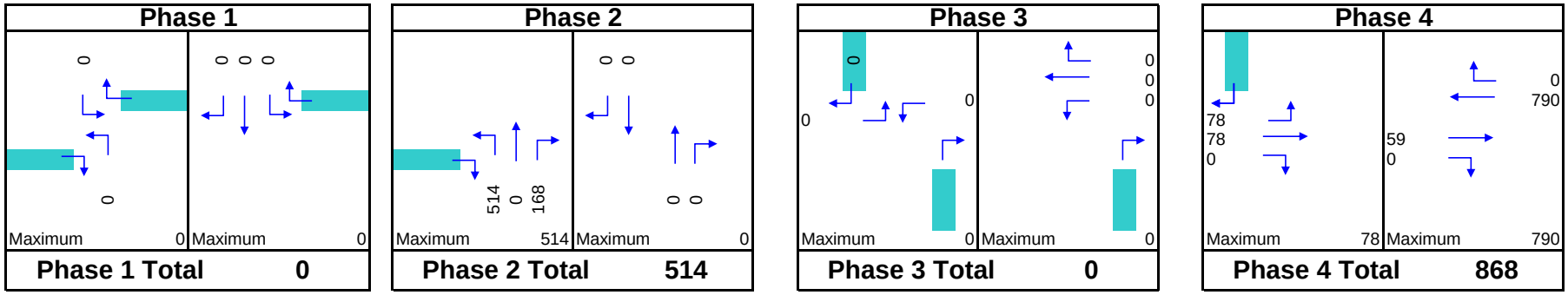
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1382

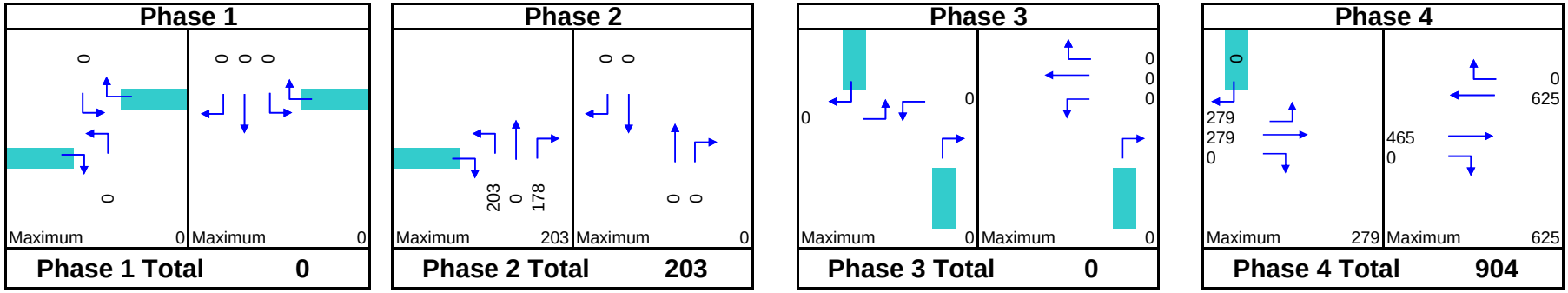
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1107

Service Level: **Under Capacity**



LINSCOTT LAW & GREENSPAN engineers

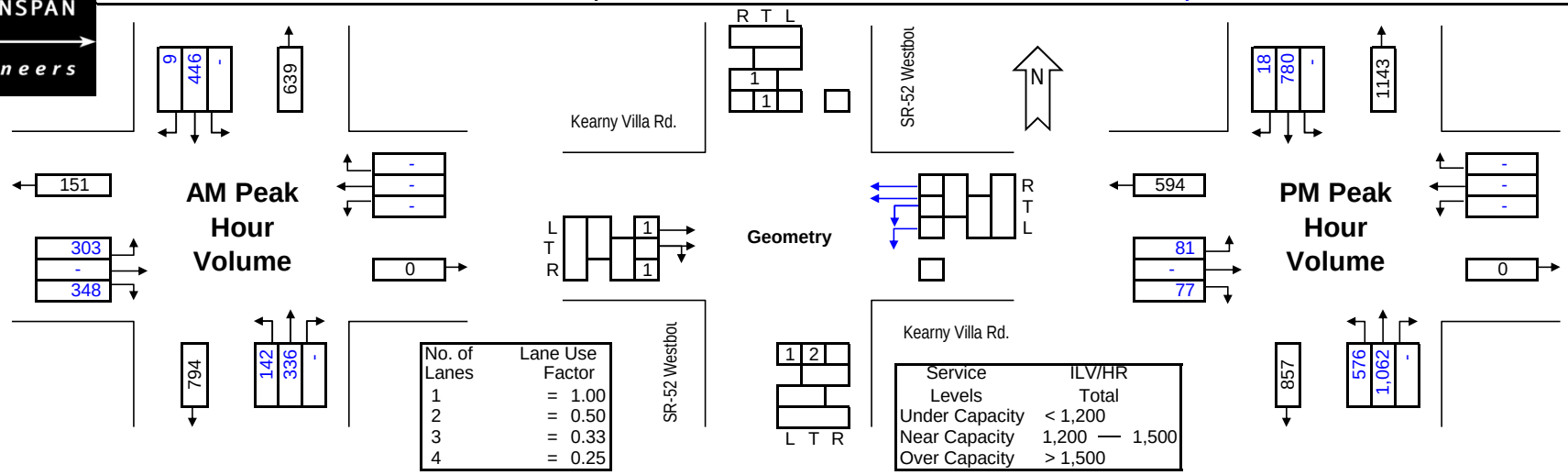
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps at Kearny Villa Rd.

N/S
E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 945

Service Level: **Under Capacity**

Phase 1

Maximum 0 | Maximum 0

Phase 1 Total 0

Phase 2

Maximum 142 | Maximum 455

Phase 2 Total 597

Phase 3

Maximum 0 | Maximum 0

Phase 3 Total 0

Phase 4

Maximum 303 | Maximum 45

Phase 4 Total 348

PM Peak Hour Analysis

Total Crictical Lane Volume 1455

Service Level: **Near Capacity**

Phase 1

Maximum 0 | Maximum 0

Phase 1 Total 0

Phase 2

Maximum 576 | Maximum 798

Phase 2 Total 1374

Phase 3

Maximum 0 | Maximum 0

Phase 3 Total 0

Phase 4

Maximum 81 | Maximum 0

Phase 4 Total 81

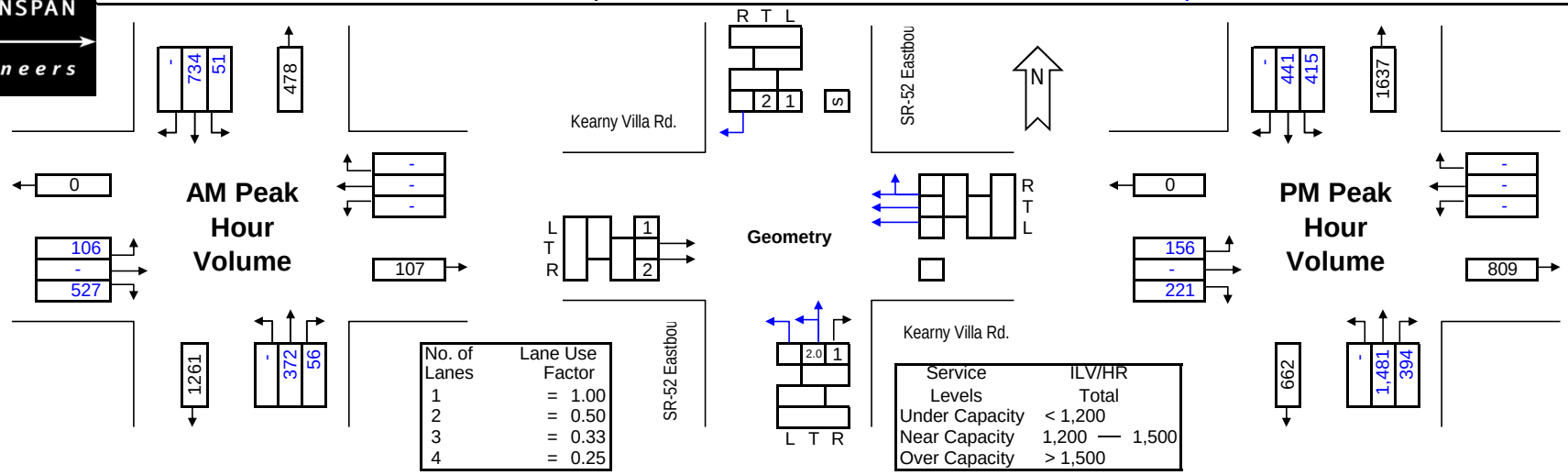
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Project PH I
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps N/S
at Kearny Villa Rd. E/W



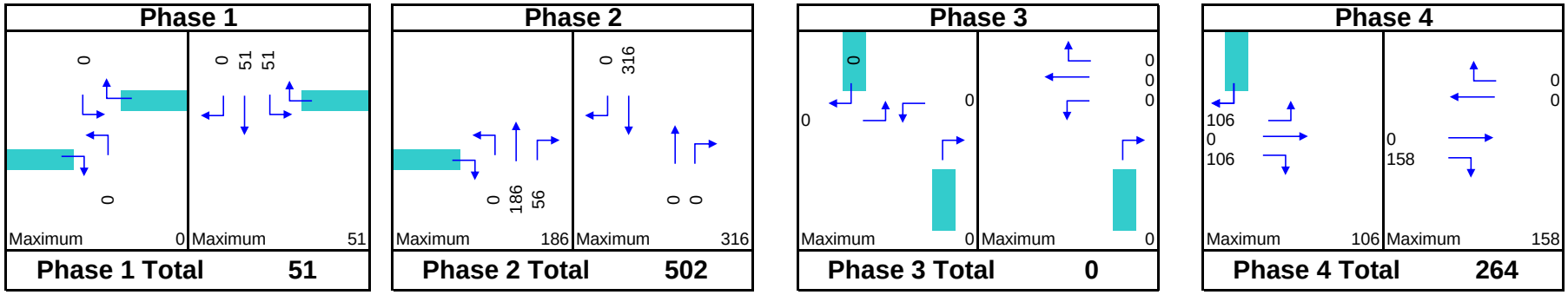
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 817

Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1312

Service Level: **Near Capacity**

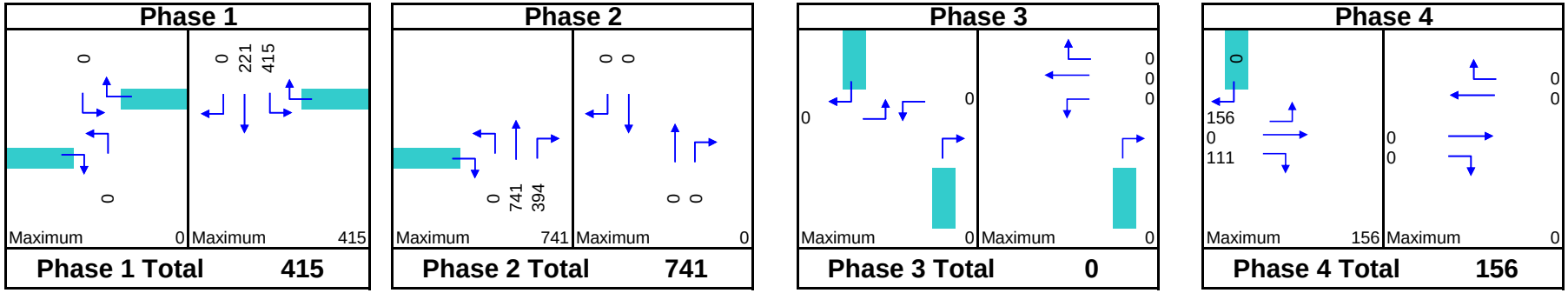


Table X
Existing + Cuml Projects + Project PH I ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	615	Under Capacity
	PM	846	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,396	Near Capacity
	PM	1,020	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	1,868	Over Capacity
	PM	1,769	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,382	Near Capacity
	PM	1,107	Under Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	945	Under Capacity
	PM	1,455	Near Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	817	Under Capacity
	PM	1,312	Near Capacity

APPENDIX H

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS AND ARTERIAL ANALYSIS WORKSHEETS - NEAR TERM + ENTIRE PROJECT

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	712	23	275	1571	199	22	10	172	123	13	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.87	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5000		1770	1533	1504	3433	3166	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5000		1770	1533	1504	3433	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	774	25	299	1708	216	24	11	187	134	14	33
RTOR Reduction (vph)	0	0	9	0	9	0	0	83	77	0	29	0
Lane Group Flow (vph)	35	774	16	299	1915	0	24	18	20	134	18	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	4.7	59.9	68.5	13.9	68.5		4.2	8.3	22.2	8.7	13.1	
Effective Green, g (s)	4.7	59.9	68.5	13.9	68.5		4.2	8.3	22.2	8.7	13.1	
Actuated g/C Ratio	0.04	0.54	0.62	0.13	0.62		0.04	0.08	0.20	0.08	0.12	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	76	2769	986	434	3114		68	116	304	272	377	
v/s Ratio Prot	0.02	0.15		c0.09	c0.38		0.01	c0.01	0.01	c0.04	0.01	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.46	0.28	0.02	0.69	0.61		0.35	0.15	0.06	0.49	0.05	
Uniform Delay, d1	51.4	13.5	7.9	46.0	12.7		51.6	47.6	35.5	48.5	42.9	
Progression Factor	1.00	1.00	1.00	1.04	0.96		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.3	0.0	3.6	0.4		1.2	0.2	0.0	0.5	0.0	
Delay (s)	53.0	13.7	7.9	51.2	12.6		52.7	47.8	35.5	49.0	42.9	
Level of Service	D	B	A	D	B		D	D	D	D	D	
Approach Delay (s)		15.2			17.8			43.0			47.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	777	230	0	1062	455	0	0	1160	0	0	300
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	845	250	0	1154	495	0	0	1261	0	0	326
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.94			0.92			0.95	0.95	0.92	0.95	0.95	0.94
vC, conflicting volume	1649			1095			1748	2493	422	2838	2249	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1563			919			1392	2181	185	2545	1922	424
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	40
cM capacity (veh/h)	394			676			38	43	756	0	63	544

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	422	422	250	577	577	495	1261	163	163
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	250	0	0	495	1261	163	163
cSH	1700	1700	1700	1700	1700	1700	756	544	544
Volume to Capacity	0.25	0.25	0.15	0.34	0.34	0.29	1.67	0.30	0.30
Queue Length 95th (ft)	0	0	0	0	0	0	1746	31	31
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	321.3	14.4	14.4
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			321.3	14.4	
Approach LOS							F	B	

Intersection Summary			
Average Delay	94.6		
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1729	205	0	628	207	822	0	921	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1879	223	0	683	225	893	0	1001	0	0	0
RTOR Reduction (vph)	0	0	137	0	0	138	0	0	0	0	0	0
Lane Group Flow (vph)	0	1879	86	0	683	87	446	447	1001	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		42.6	42.6		42.6	42.6	56.6	56.6	56.6			
Effective Green, g (s)		42.6	42.6		42.6	42.6	56.6	56.6	56.6			
Actuated g/C Ratio		0.39	0.39		0.39	0.39	0.51	0.51	0.51			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		1969	613		1969	613	865	865	1434			
v/s Ratio Prot		c0.37			0.13		0.27	0.27	c0.36			
v/s Ratio Perm			0.05			0.06						
v/c Ratio		0.95	0.14		0.35	0.14	0.52	0.52	0.70			
Uniform Delay, d1		32.8	21.8		23.9	21.9	17.6	17.7	20.2			
Progression Factor		0.92	0.65		0.26	0.28	1.00	1.00	1.00			
Incremental Delay, d2		12.0	0.5		0.5	0.5	0.5	0.5	1.5			
Delay (s)		42.0	14.8		6.8	6.6	18.2	18.2	21.7			
Level of Service		D	B		A	A	B	B	C			
Approach Delay (s)		39.1			6.7			20.0			0.0	
Approach LOS		D			A			C			A	

Intersection Summary				
HCM Average Control Delay	25.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	74.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
4: Clairemont Mesa Boulevard & Kearny Villa Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	1451	1037	146	626	12	146	81	132	39	89	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	1577	1127	159	680	13	159	88	143	42	97	150
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	63	0	0	67
Lane Group Flow (vph)	177	1577	1127	159	680	2	159	88	80	42	97	83
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	4.0	61.3	110.0	4.0	61.2	19.9	14.5	19.9	61.3	5.6	11.2	61.2
Effective Green, g (s)	4.0	61.3	110.0	4.0	61.2	19.9	14.5	19.9	61.3	5.6	11.2	61.2
Actuated g/C Ratio	0.04	0.56	1.00	0.04	0.56	0.18	0.13	0.18	0.56	0.05	0.10	0.56
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	2834	1583	64	2829	286	453	337	882	90	190	881
v/s Ratio Prot	0.05	0.31		c0.09	0.13		0.05	0.05		0.02	0.05	
v/s Ratio Perm			c0.71			0.00			0.05			0.05
v/c Ratio	1.42	0.56	0.71	2.48	0.24	0.01	0.35	0.26	0.09	0.47	0.51	0.09
Uniform Delay, d1	53.0	15.6	0.0	53.0	12.5	37.0	43.5	38.7	11.4	50.7	46.8	11.4
Progression Factor	0.90	0.72	1.00	1.19	0.68	2.69	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	209.5	0.4	1.4	711.3	0.2	0.0	0.5	0.4	0.2	3.8	2.3	0.2
Delay (s)	257.1	11.6	1.4	774.1	8.8	99.5	43.9	39.1	11.6	54.5	49.1	11.6
Level of Service	F	B	A	F	A	F	D	D	B	D	D	B
Approach Delay (s)		22.7			153.0			31.0			30.5	
Approach LOS		C			F			C			C	

Intersection Summary				
HCM Average Control Delay	49.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	4.4	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
5: Clairemont Mesa Boulevard & Complex Street

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	222	1120	100	68	687	95	45	4	83	51	1	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.95	1.00
Satd. Flow (prot)	1770	5023		1770	4993			1780	1583		1776	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.70	1.00		0.69	1.00
Satd. Flow (perm)	1770	5023		1770	4993			1307	1583		1287	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	241	1217	109	74	747	103	49	4	90	55	1	37
RTOR Reduction (vph)	0	6	0	0	7	0	0	0	83	0	0	34
Lane Group Flow (vph)	241	1320	0	74	843	0	0	53	7	0	56	3
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	21.4	80.5		8.7	67.8			8.8	8.8		8.8	8.8
Effective Green, g (s)	21.4	80.5		8.7	67.8			8.8	8.8		8.8	8.8
Actuated g/C Ratio	0.19	0.73		0.08	0.62			0.08	0.08		0.08	0.08
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	344	3676		140	3078			105	127		103	127
v/s Ratio Prot	c0.14	c0.26		0.04	0.17							
v/s Ratio Perm								0.04	0.00		c0.04	0.00
v/c Ratio	0.70	0.36		0.53	0.27			0.50	0.06		0.54	0.02
Uniform Delay, d1	41.3	5.4		48.7	9.7			48.5	46.8		48.7	46.6
Progression Factor	0.53	2.14		0.54	3.28			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.6	0.2		2.8	0.2			3.8	0.2		5.8	0.1
Delay (s)	27.3	11.7		29.2	32.1			52.3	47.0		54.4	46.7
Level of Service	C	B		C	C			D	D		D	D
Approach Delay (s)		14.1			31.9			48.9			51.4	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
6: Clairemont Mesa Boulevard & Overland Avenue

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	757	281	162	666	63	146	169	76	31	28	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4879		3433	5085	1583	1770	3374		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4879		3433	5085	1583	1770	3374		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	323	823	305	176	724	68	159	184	83	34	30	66
RTOR Reduction (vph)	0	62	0	0	0	51	0	43	0	0	0	41
Lane Group Flow (vph)	323	1066	0	176	724	17	159	224	0	34	30	25
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	13.8	25.5		9.3	20.9	20.9	14.7	51.4		5.1	41.8	41.8
Effective Green, g (s)	13.8	25.5		9.3	20.9	20.9	14.7	51.4		5.1	41.8	41.8
Actuated g/C Ratio	0.13	0.23		0.08	0.19	0.19	0.13	0.47		0.05	0.38	0.38
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	431	1131		290	966	301	237	1577		82	708	602
v/s Ratio Prot	c0.09	c0.22		0.05	0.14		c0.09	c0.07		0.02	0.02	
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.75	0.94		0.61	0.75	0.06	0.67	0.14		0.41	0.04	0.04
Uniform Delay, d1	46.4	41.5		48.6	42.1	36.5	45.3	16.7		51.0	21.5	21.5
Progression Factor	0.77	0.91		1.00	1.62	3.17	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.8	15.6		2.6	4.0	0.3	7.3	0.0		3.4	0.1	0.1
Delay (s)	42.4	53.4		51.4	72.2	115.9	52.6	16.8		54.4	21.6	21.6
Level of Service	D	D		D	E	F	D	B		D	C	C
Approach Delay (s)		50.9			71.5			30.1			30.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM Average Control Delay	53.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
7: Clairemont Mesa Boulevard & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	355	372	205	472	691	376	121	247	76	205	507	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4814		3433	4816		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4814		3433	4816		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	404	223	513	751	409	132	268	83	223	551	153
RTOR Reduction (vph)	0	91	0	0	83	0	0	0	58	0	0	93
Lane Group Flow (vph)	386	536	0	513	1077	0	132	268	25	223	551	60
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	17.5	33.0		16.6	32.2		8.2	33.0	33.0	7.8	32.8	32.8
Effective Green, g (s)	17.5	33.0		16.6	32.2		8.2	33.0	33.0	7.8	32.8	32.8
Actuated g/C Ratio	0.16	0.30		0.15	0.29		0.07	0.30	0.30	0.07	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	546	1444		518	1410		256	1062	475	243	1055	472
v/s Ratio Prot	0.11	0.11		c0.15	c0.22		0.04	0.08		c0.06	c0.16	
v/s Ratio Perm									0.02			0.04
v/c Ratio	0.71	0.37		0.99	0.76		0.52	0.25	0.05	0.92	0.52	0.13
Uniform Delay, d1	43.8	30.3		46.6	35.4		49.0	29.2	27.4	50.8	32.1	28.2
Progression Factor	1.12	2.16		1.09	0.85		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.5		35.8	3.8		1.8	0.6	0.2	35.9	1.8	0.6
Delay (s)	51.7	66.0		86.7	34.0		50.7	29.7	27.6	86.7	33.9	28.7
Level of Service	D	E		F	C		D	C	C	F	C	C
Approach Delay (s)		60.5			50.2			35.1			45.8	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	50.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	19.3	
Intersection Capacity Utilization	65.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
8: Clairemont Mesa Boulevard & Project Access

2/15/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	644	110	451	1500	39	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	700	120	490	1630	42	171
RTOR Reduction (vph)	0	23	0	0	0	86
Lane Group Flow (vph)	700	97	490	1630	42	85
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	66.7	74.8	21.2	92.4	8.1	29.3
Effective Green, g (s)	66.7	74.8	21.2	92.4	8.1	29.3
Actuated g/C Ratio	0.61	0.68	0.19	0.84	0.07	0.27
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3083	1076	662	4271	130	854
v/s Ratio Prot	0.14	0.01	c0.14	c0.32	c0.02	0.02
v/s Ratio Perm		0.05				0.01
v/c Ratio	0.23	0.09	0.74	0.38	0.32	0.10
Uniform Delay, d1	9.9	6.0	41.8	2.1	48.3	30.4
Progression Factor	1.25	2.25	1.28	0.75	1.00	1.00
Incremental Delay, d2	0.2	0.0	4.3	0.2	1.4	0.1
Delay (s)	12.5	13.5	58.0	1.8	49.8	30.5
Level of Service	B	B	E	A	D	C
Approach Delay (s)	12.6			14.8	34.3	
Approach LOS	B			B	C	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	40.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	608	137	382	1460	160	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	661	149	415	1587	174	76
RTOR Reduction (vph)	0	0	40	0	0	0	17
Lane Group Flow (vph)	0	661	109	415	1587	174	59
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		47.7	47.7	30.7	83.4	16.2	46.9
Effective Green, g (s)		47.7	47.7	30.7	83.4	16.2	46.9
Actuated g/C Ratio		0.43	0.43	0.28	0.76	0.15	0.43
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1535	686	494	3855	261	675
v/s Ratio Prot		0.19		c0.23	c0.31	c0.10	0.02
v/s Ratio Perm			0.07				0.01
v/c Ratio		0.43	0.16	0.84	0.41	0.67	0.09
Uniform Delay, d1		21.7	18.9	37.3	4.7	44.3	18.8
Progression Factor		1.10	1.24	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9	0.5	12.2	0.3	6.3	0.1
Delay (s)		24.8	23.9	49.5	5.0	50.6	18.9
Level of Service		C	C	D	A	D	B
Approach Delay (s)		24.6			14.2	41.0	
Approach LOS		C			B	D	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.7
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	342	336	462	1281	0	0	0	0	99	1	670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1447	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1447	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	372	365	502	1392	0	0	0	0	108	1	728
RTOR Reduction (vph)	0	0	249	0	0	0	0	0	0	0	23	23
Lane Group Flow (vph)	0	372	116	502	1392	0	0	0	0	97	346	348
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		37.4	31.7	18.9	60.3					31.7	31.7	31.7
Effective Green, g (s)		37.4	31.7	18.9	60.3					31.7	31.7	31.7
Actuated g/C Ratio		0.37	0.32	0.19	0.60					0.32	0.32	0.32
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1324	883	649	2134					533	459	477
v/s Ratio Prot		0.11		c0.15	c0.39					0.06	c0.24	
v/s Ratio Perm			0.04									0.23
v/c Ratio		0.28	0.13	0.77	0.65					0.18	0.75	0.73
Uniform Delay, d1		21.9	24.3	38.5	13.0					24.8	30.6	30.3
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	5.7	1.6					0.2	6.9	5.5
Delay (s)		22.0	24.4	44.2	14.6					24.9	37.5	35.9
Level of Service		C	C	D	B					C	D	D
Approach Delay (s)		23.2			22.4			0.0			35.3	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	166	275	0	0	597	198	1147	0	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3407		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3407		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	299	0	0	649	215	1247	0	183	0	0	0
RTOR Reduction (vph)	0	0	0	0	40	0	0	0	108	0	0	0
Lane Group Flow (vph)	180	299	0	0	824	0	1247	0	75	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	6.9	37.0			25.9		33.0		33.0			
Effective Green, g (s)	6.9	37.0			25.9		33.0		33.0			
Actuated g/C Ratio	0.09	0.46			0.32		0.41		0.41			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	296	1637			1103		1416		653			
v/s Ratio Prot	c0.05	0.08			c0.24		c0.36					
v/s Ratio Perm									0.05			
v/c Ratio	0.61	0.18			0.75		0.88		0.12			
Uniform Delay, d1	35.2	12.6			24.1		21.7		14.5			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	3.5	0.2			4.6		6.7		0.1			
Delay (s)	38.8	12.9			28.8		28.4		14.6			
Level of Service	D	B			C		C		B			
Approach Delay (s)		22.6			28.8			26.6			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	26.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	92.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
12: Lightwave Avenue & Overland Avenue

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	139	52	104	210	240	50	128	35	131	304	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.92		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3394		1770	3256		1770	3425		1770	3407	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3394		1770	3256		1770	3425		1770	3407	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	151	57	113	228	261	54	139	38	142	330	109
RTOR Reduction (vph)	0	44	0	0	206	0	0	27	0	0	34	0
Lane Group Flow (vph)	111	164	0	113	283	0	54	150	0	142	405	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.6	11.9		6.6	11.9		3.7	12.2		7.3	15.8	
Effective Green, g (s)	6.6	11.9		6.6	11.9		3.7	12.2		7.3	15.8	
Actuated g/C Ratio	0.12	0.21		0.12	0.21		0.07	0.22		0.13	0.28	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	206	714		206	685		116	738		228	951	
v/s Ratio Prot	0.06	0.05		c0.06	c0.09		0.03	0.04		c0.08	c0.12	
v/s Ratio Perm												
v/c Ratio	0.54	0.23		0.55	0.41		0.47	0.20		0.62	0.43	
Uniform Delay, d1	23.6	18.5		23.6	19.3		25.5	18.2		23.3	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.2		1.6	0.5		1.1	0.2		3.8	0.3	
Delay (s)	24.9	18.7		25.2	19.8		26.6	18.4		27.1	17.0	
Level of Service	C	B		C	B		C	B		C	B	
Approach Delay (s)		20.9			20.8			20.3			19.5	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	18.6	
Intersection Capacity Utilization	49.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	303	356	150	336	446	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3528	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	329	387	163	365	485	10
RTOR Reduction (vph)	0	224	0	0	1	0
Lane Group Flow (vph)	329	163	163	365	494	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.3	20.3	12.5	48.4	31.7	
Effective Green, g (s)	20.3	20.3	12.5	48.4	31.7	
Actuated g/C Ratio	0.25	0.25	0.16	0.60	0.40	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	449	402	277	2141	1398	
v/s Ratio Prot	c0.19		c0.09	0.10	c0.14	
v/s Ratio Perm		0.10				
v/c Ratio	0.73	0.41	0.59	0.17	0.35	
Uniform Delay, d1	27.4	24.8	31.4	7.0	17.0	
Progression Factor	1.00	1.00	1.12	1.17	1.00	
Incremental Delay, d2	6.1	0.7	3.1	0.2	0.7	
Delay (s)	33.5	25.5	38.2	8.3	17.7	
Level of Service	C	C	D	A	B	
Approach Delay (s)	29.2			17.5	17.7	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	0	548	0	0	0	0	380	59	51	742	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	0	596	0	0	0	0	413	64	55	807	0
RTOR Reduction (vph)	0	0	158	0	0	0	0	0	32	0	0	0
Lane Group Flow (vph)	0	115	438	0	0	0	0	413	32	55	807	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		19.1	19.1					39.9	39.9	5.5	49.6	
Effective Green, g (s)		19.1	19.1					39.9	39.9	5.5	49.6	
Actuated g/C Ratio		0.24	0.24					0.50	0.50	0.07	0.62	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		423	665					1765	790	122	2194	
v/s Ratio Prot								0.12		0.03	c0.23	
v/s Ratio Perm		0.06	c0.16						0.02			
v/c Ratio		0.27	0.66					0.23	0.04	0.45	0.37	
Uniform Delay, d1		24.8	27.5					11.4	10.3	35.8	7.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.12	
Incremental Delay, d2		0.3	2.4					0.3	0.1	2.4	0.4	
Delay (s)		25.1	29.9					11.7	10.4	38.2	8.8	
Level of Service		C	C					B	B	D	A	
Approach Delay (s)		29.1			0.0			11.5			10.7	
Approach LOS		C			A			B			B	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
15: Kearny Villa Road & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	129	73	47	6	3	9	18	299	49	76	962	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.98		1.00	0.97	
Flt Protected	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1744	1583	1770	1648		1770	3465		3433	3429	
Flt Permitted	0.95	0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1744	1583	1770	1648		1770	3465		3433	3429	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	79	51	7	3	10	20	325	53	83	1046	275
RTOR Reduction (vph)	0	0	44	0	10	0	0	15	0	0	26	0
Lane Group Flow (vph)	108	111	7	7	3	0	20	363	0	83	1295	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.7	7.7	7.7	1.8	1.8		1.1	29.2		2.5	30.6	
Effective Green, g (s)	7.7	7.7	7.7	1.8	1.8		1.1	29.2		2.5	30.6	
Actuated g/C Ratio	0.13	0.13	0.13	0.03	0.03		0.02	0.51		0.04	0.53	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	226	235	213	56	52		34	1769		150	1834	
v/s Ratio Prot	c0.06	0.06		c0.00	0.00		0.01	0.10		c0.02	c0.38	
v/s Ratio Perm			0.00									
v/c Ratio	0.48	0.47	0.03	0.12	0.06		0.59	0.21		0.55	0.71	
Uniform Delay, d1	22.9	22.9	21.5	26.9	26.9		27.8	7.7		26.8	9.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	1.5	0.1	1.0	0.5		23.4	0.1		4.4	1.3	
Delay (s)	24.5	24.4	21.6	27.9	27.4		51.2	7.7		31.2	11.2	
Level of Service	C	C	C	C	C		D	A		C	B	
Approach Delay (s)		23.9			27.6			9.9			12.4	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM Average Control Delay	13.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
16: Chesapeake Drive & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	38	33	29	37	63	105	299	28	98	916	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.98	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1833	1583		1822	1583	1770	3494		1770	3485	
Flt Permitted		0.86	1.00		0.83	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607	1583		1542	1583	1770	3494		1770	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	41	36	32	40	68	114	325	30	107	996	114
RTOR Reduction (vph)	0	0	33	0	0	61	0	6	0	0	7	0
Lane Group Flow (vph)	0	61	3	0	72	7	114	349	0	107	1103	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		5.1	5.1		5.7	5.7	5.3	28.5		6.1	29.3	
Effective Green, g (s)		5.1	5.1		5.7	5.7	5.3	28.5		6.1	29.3	
Actuated g/C Ratio		0.09	0.09		0.10	0.10	0.10	0.52		0.11	0.53	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		149	147		160	164	171	1814		197	1860	
v/s Ratio Prot							c0.06	0.10		0.06	c0.32	
v/s Ratio Perm		0.04	0.00		c0.05	0.00						
v/c Ratio		0.41	0.02		0.45	0.04	0.67	0.19		0.54	0.59	
Uniform Delay, d1		23.5	22.6		23.1	22.1	23.9	7.1		23.1	8.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0		0.7	0.0	7.4	0.1		1.6	0.6	
Delay (s)		24.1	22.7		23.9	22.2	31.3	7.1		24.7	9.4	
Level of Service		C	C		C	C	C	A		C	A	
Approach Delay (s)		23.6			23.0			13.0			10.7	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	12.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	56.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
17: Hazard Way & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	0	21	2	0	0	41	366	5	6	776	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3533		1770	3494	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3533		1770	3494	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	0	23	2	0	0	45	398	5	7	843	78
RTOR Reduction (vph)	0	22	0	0	0	0	0	1	0	0	4	0
Lane Group Flow (vph)	24	1	0	0	2	0	45	402	0	7	917	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.1	2.1			0.8		0.6	19.2		0.5	19.1	
Effective Green, g (s)	2.1	2.1			0.8		0.6	19.2		0.5	19.1	
Actuated g/C Ratio	0.05	0.05			0.02		0.01	0.46		0.01	0.45	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	88	79			34		49	1611		21	1585	
v/s Ratio Prot	c0.01	0.00			c0.00		c0.01	0.11		0.00	c0.26	
v/s Ratio Perm												
v/c Ratio	0.27	0.01			0.06		0.92	0.25		0.33	0.58	
Uniform Delay, d1	19.3	19.0			20.3		20.7	7.0		20.6	8.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.0			0.3		95.9	0.2		3.4	1.0	
Delay (s)	19.9	19.0			20.5		116.6	7.2		24.0	9.5	
Level of Service	B	B			C		F	A		C	A	
Approach Delay (s)		19.5			20.5			18.2			9.6	
Approach LOS		B			C			B			A	

Intersection Summary				
HCM Average Control Delay	12.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	38.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
18: Farnham St & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	11	21	23	13	7	200	676	82	34	657	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799	1583		1805	1583	3433	3482		1770	3465	
Flt Permitted		0.93	1.00		0.89	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1726	1583		1652	1583	3433	3482		1770	3465	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	12	23	25	14	8	217	735	89	37	714	116
RTOR Reduction (vph)	0	0	21	0	0	7	0	8	0	0	13	0
Lane Group Flow (vph)	0	42	2	0	39	1	217	816	0	37	817	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		3.7	3.7		3.7	3.7	6.7	28.6		1.4	23.3	
Effective Green, g (s)		3.7	3.7		3.7	3.7	6.7	28.6		1.4	23.3	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.14	0.59		0.03	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		132	121		127	121	476	2062		51	1672	
v/s Ratio Prot							c0.06	0.23		0.02	c0.24	
v/s Ratio Perm		c0.02	0.00		0.02	0.00						
v/c Ratio		0.32	0.01		0.31	0.01	0.46	0.40		0.73	0.49	
Uniform Delay, d1		21.1	20.6		21.1	20.6	19.1	5.2		23.3	8.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		0.5	0.0	0.3	0.3		34.9	0.6	
Delay (s)		21.6	20.6		21.6	20.6	19.4	5.6		58.2	9.1	
Level of Service		C	C		C	C	B	A		E	A	
Approach Delay (s)		21.3			21.4			8.5			11.1	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM Average Control Delay	10.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
19: Project Access & Ruffin Road
2/15/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	28	416	80	0	1216
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	30	452	87	0	1322
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.88					
vC, conflicting volume	1113	226			539	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	846	226			539	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	264	777			1025	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	30	226	226	87	661	661
Volume Left	0	0	0	0	0	0
Volume Right	30	0	0	87	0	0
cSH	777	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.13	0.13	0.05	0.39	0.39
Queue Length 95th (ft)	3	0	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.8	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		36.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
20: Lightwave Avenue & Ruffin Road
2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	99	110	58	93	129	317	389	50	354	601	323
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1700		3433	3479		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1700		3433	3479		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	108	120	63	101	140	345	423	54	385	653	351
RTOR Reduction (vph)	0	0	71	0	53	0	0	9	0	0	0	210
Lane Group Flow (vph)	103	108	49	63	188	0	345	468	0	385	653	141
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	5.2	14.5	27.7	5.3	15.2		13.2	16.4		22.3	25.5	30.7
Effective Green, g (s)	5.2	14.5	27.7	5.3	15.2		13.2	16.4		22.3	25.5	30.7
Actuated g/C Ratio	0.07	0.19	0.36	0.07	0.20		0.17	0.21		0.29	0.33	0.40
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	233	353	572	122	337		592	745		515	1178	634
v/s Ratio Prot	0.03	0.06	0.01	c0.04	c0.11		0.10	0.13		c0.22	c0.18	0.02
v/s Ratio Perm			0.02									0.07
v/c Ratio	0.44	0.31	0.08	0.52	0.56		0.58	0.63		0.75	0.55	0.22
Uniform Delay, d1	34.3	26.7	16.1	34.4	27.7		29.2	27.3		24.6	20.9	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.5	0.1	3.7	2.0		1.5	1.7		5.9	0.6	0.2
Delay (s)	35.6	27.2	16.2	38.1	29.7		30.6	29.0		30.5	21.5	15.3
Level of Service	D	C	B	D	C		C	C		C	C	B
Approach Delay (s)		25.8			31.4			29.7			22.4	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay		25.9	HCM Level of Service	C
HCM Volume to Capacity ratio		0.56		
Actuated Cycle Length (s)		76.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization		62.7%	ICU Level of Service	B
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
21: Spectrum Center Boulevard & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	54	3	143	9	0	5	499	753	40	12	494	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3513		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3513		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	3	155	10	0	5	542	818	43	13	537	182
RTOR Reduction (vph)	0	0	107	0	0	5	0	2	0	0	0	98
Lane Group Flow (vph)	59	3	48	0	10	0	542	859	0	13	537	84
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	3.6	3.6	19.1		0.9	0.9	15.5	36.0		0.5	21.0	21.0
Effective Green, g (s)	3.6	3.6	19.1		0.9	0.9	15.5	36.0		0.5	21.0	21.0
Actuated g/C Ratio	0.06	0.06	0.31		0.01	0.01	0.25	0.59		0.01	0.34	0.34
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	202	110	495		26	23	871	2070		14	1216	544
v/s Ratio Prot	c0.02	0.00	0.02		c0.01		c0.16	c0.24		0.01	0.15	
v/s Ratio Perm			0.01			0.00						0.05
v/c Ratio	0.29	0.03	0.10		0.38	0.00	0.62	0.41		0.93	0.44	0.15
Uniform Delay, d1	27.5	27.1	14.9		29.8	29.7	20.2	6.8		30.3	15.5	13.9
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.1		9.2	0.1	1.4	0.1		201.0	0.3	0.1
Delay (s)	28.3	27.2	15.0		39.0	29.7	21.6	7.0		231.2	15.8	14.0
Level of Service	C	C	B		D	C	C	A		F	B	B
Approach Delay (s)		18.8			35.9			12.6			19.2	
Approach LOS		B			D			B			B	

Intersection Summary				
HCM Average Control Delay	15.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	61.1	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	48.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)
22: Balboa Avenue & Ruffin Road

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	199	257	398	584	881	693	117	480	66	146	306	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4621		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4621		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	279	433	635	958	753	127	522	72	159	333	109
RTOR Reduction (vph)	0	197	0	0	0	150	0	0	56	0	0	88
Lane Group Flow (vph)	216	515	0	635	958	603	127	522	16	159	333	21
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	15.3	17.7		21.9	24.5	29.2	8.1	19.2	19.2	4.7	15.9	15.9
Effective Green, g (s)	15.3	17.7		21.9	24.5	29.2	8.1	19.2	19.2	4.7	15.9	15.9
Actuated g/C Ratio	0.18	0.21		0.26	0.29	0.35	0.10	0.23	0.23	0.06	0.19	0.19
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	322	974		461	1483	969	331	809	362	192	670	300
v/s Ratio Prot	0.12	0.11		c0.36	c0.19	0.03	0.04	c0.15		c0.05	0.09	
v/s Ratio Perm						0.18			0.01			0.01
v/c Ratio	0.67	0.53		1.38	0.65	0.62	0.38	0.65	0.05	0.83	0.50	0.07
Uniform Delay, d1	32.0	29.4		31.1	26.0	22.8	35.6	29.3	25.3	39.3	30.5	28.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	0.5		183.1	1.0	1.3	0.7	1.8	0.1	24.4	0.6	0.1
Delay (s)	37.4	30.0		214.1	26.9	24.1	36.4	31.1	25.3	63.7	31.1	28.1
Level of Service	D	C		F	C	C	D	C	C	E	C	C
Approach Delay (s)		31.7			76.7			31.4			39.1	
Approach LOS		C			E			C			D	

Intersection Summary				
HCM Average Control Delay	55.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	80.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)

23: Balboa Avenue & Viewridge Avenue — 2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	314	35	348	2121	507	17	16	35	98	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5009		1770	6222			1816	1583	1770	1651	
Flt Permitted	0.95	1.00		0.95	1.00			0.86	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5009		1770	6222			1597	1583	1368	1651	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	341	38	378	2305	551	18	17	38	107	7	22
RTOR Reduction (vph)	0	8	0	0	26	0	0	0	33	0	19	0
Lane Group Flow (vph)	114	371	0	378	2830	0	0	35	5	107	10	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	8.8	39.4		23.2	54.8			12.4	12.4	12.4	12.4	
Effective Green, g (s)	8.8	39.4		23.2	54.8			12.4	12.4	12.4	12.4	
Actuated g/C Ratio	0.10	0.43		0.25	0.60			0.14	0.14	0.14	0.14	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	170	2159		449	3730			217	215	186	224	
v/s Ratio Prot	0.06	0.07		c0.21	c0.45						0.01	
v/s Ratio Perm								0.02	0.00	c0.08		
v/c Ratio	0.67	0.17		0.84	0.76			0.16	0.02	0.58	0.04	
Uniform Delay, d1	39.9	16.0		32.4	13.4			34.9	34.3	37.0	34.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.9	0.0		13.4	0.9			0.4	0.0	4.3	0.1	
Delay (s)	49.8	16.0		45.7	14.4			35.3	34.3	41.3	34.4	
Level of Service	D	B		D	B			D	C	D	C	
Approach Delay (s)		23.8			18.0			34.8			39.8	
Approach LOS		C			B			C			D	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	91.4	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj AM (Year 2030)

24: Ruffin Court & Driveway #3 — 2/15/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	150	295	203	50	18	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	321	221	54	20	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	275				895	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275				895	248
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				93	93
cM capacity (veh/h)	1288				272	791

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	321	275	77
Volume Left	163	0	0	20
Volume Right	0	0	54	58
cSH	1288	1700	1700	533
Volume to Capacity	0.13	0.19	0.16	0.14
Queue Length 95th (ft)	11	0	0	13
Control Delay (s)	8.2	0.0	0.0	12.9
Lane LOS	A			B
Approach Delay (s)	2.8		0.0	12.9
Approach LOS				B

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	30	229	150	30	11	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	249	163	33	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	196				493	179
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	196				493	179
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	99
cM capacity (veh/h)	1377				522	863

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	249	196	24
Volume Left	33	0	0	12
Volume Right	0	0	33	12
cSH	1377	1700	1700	651
Volume to Capacity	0.02	0.15	0.12	0.04
Queue Length 95th (ft)	2	0	0	3
Control Delay (s)	7.7	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	0.9		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1589	58	200	1160	115	40	9	516	227	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5016		1770	1513	1504	3433	3137	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5016		1770	1513	1504	3433	3137	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1727	63	217	1261	125	43	10	561	247	16	50
RTOR Reduction (vph)	0	0	19	0	7	0	0	122	5	0	40	0
Lane Group Flow (vph)	54	1727	44	217	1379	0	43	163	281	247	26	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.2	73.2	78.0	12.6	78.0		3.4	19.4	32.0	10.6	26.9	
Effective Green, g (s)	7.2	73.2	78.0	12.6	78.0		3.4	19.4	32.0	10.6	26.9	
Actuated g/C Ratio	0.05	0.54	0.58	0.09	0.58		0.03	0.14	0.24	0.08	0.20	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	94	2757	915	320	2898		45	217	357	270	625	
v/s Ratio Prot	0.03	c0.34		0.06	0.27		0.02	0.11	c0.07	c0.07	0.01	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	0.57	0.63	0.05	0.68	0.48		0.96	0.75	0.79	0.91	0.04	
Uniform Delay, d1	62.4	21.4	12.4	59.2	16.6		65.7	55.5	48.3	61.8	43.6	
Progression Factor	1.00	1.00	1.00	0.96	0.72		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.2	1.1	0.0	4.2	0.2		115.5	12.3	10.1	32.5	0.0	
Delay (s)	67.6	22.5	12.4	61.1	12.1		181.2	67.8	58.4	94.2	43.7	
Level of Service	E	C	B	E	B		F	E	E	F	D	
Approach Delay (s)		23.5			18.7			71.3			83.6	
Approach LOS		C			B			E			F	

Intersection Summary				
HCM Average Control Delay	32.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1511	820	0	988	1068	0	0	408	0	0	450
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1642	891	0	1074	1161	0	0	443	0	0	489
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.89			0.77			0.82	0.82	0.77	0.82	0.82	0.89
vC, conflicting volume	2235			2534			2668	3877	821	2339	3608	537
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2136			2391			1972	3443	152	1571	3115	220
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	33	100	100	30
cM capacity (veh/h)	222			152			9	6	663	20	9	695

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	821	821	891	537	537	1161	443	245	245
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	891	0	0	1161	443	245	245
cSH	1700	1700	1700	1700	1700	1700	663	695	695
Volume to Capacity	0.48	0.48	0.52	0.32	0.32	0.68	0.67	0.35	0.35
Queue Length 95th (ft)	0	0	0	0	0	0	128	40	40
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	20.7	13.0	13.0
Lane LOS							C	B	B
Approach Delay (s)	0.0			0.0			20.7	13.0	
Approach LOS							C	B	

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1114	805	0	1826	690	215	0	414	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1211	875	0	1985	750	234	0	450	0	0	0
RTOR Reduction (vph)	0	0	270	0	0	108	0	0	1	0	0	0
Lane Group Flow (vph)	0	1211	605	0	1985	642	117	117	449	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		93.4	93.4		93.4	93.4	30.8	30.8	30.8			
Effective Green, g (s)		93.4	93.4		93.4	93.4	30.8	30.8	30.8			
Actuated g/C Ratio		0.69	0.69		0.69	0.69	0.23	0.23	0.23			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3518	1095		3518	1095	384	384	636			
v/s Ratio Prot		0.24			0.39		0.07	0.07	c0.16			
v/s Ratio Perm			0.38			c0.41						
v/c Ratio		0.34	0.55		0.56	0.59	0.30	0.30	0.71			
Uniform Delay, d1		8.4	10.4		10.5	10.8	43.2	43.2	47.9			
Progression Factor		1.49	7.73		0.79	0.88	1.00	1.00	1.00			
Incremental Delay, d2		0.2	1.7		0.4	1.4	0.5	0.5	3.6			
Delay (s)		12.7	82.0		8.7	10.9	43.7	43.7	51.5			
Level of Service		B	F		A	B	D	D	D			
Approach Delay (s)		41.8			9.3			48.8			0.0	
Approach LOS		D			A			D			A	

Intersection Summary				
HCM Average Control Delay	26.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
4: Clairemont Mesa Boulevard & Kearny Villa Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	979	372	163	1751	24	509	122	222	39	114	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	1064	404	177	1903	26	553	133	241	42	124	297
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	129	0	0	147
Lane Group Flow (vph)	191	1064	404	177	1903	20	553	133	112	42	124	150
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	13.1	62.5	135.0	18.7	68.0	27.1	19.6	27.1	62.5	7.5	15.2	68.0
Effective Green, g (s)	13.1	62.5	135.0	18.7	68.0	27.1	19.6	27.1	62.5	7.5	15.2	68.0
Actuated g/C Ratio	0.10	0.46	1.00	0.14	0.50	0.20	0.15	0.20	0.46	0.06	0.11	0.50
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	333	2354	1583	245	2561	318	498	374	733	98	210	797
v/s Ratio Prot	0.06	0.21		c0.10	c0.37		c0.16	0.07		0.02	c0.07	
v/s Ratio Perm			0.26			0.01			0.07			0.09
v/c Ratio	0.57	0.45	0.26	0.72	0.74	0.06	1.11	0.36	0.15	0.43	0.59	0.19
Uniform Delay, d1	58.3	24.6	0.0	55.7	26.6	43.7	57.7	46.4	20.9	61.7	56.9	18.4
Progression Factor	0.78	1.23	1.00	1.08	1.27	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.6	0.4	9.9	2.0	0.1	74.1	0.6	0.4	3.0	4.4	0.5
Delay (s)	47.9	30.9	0.4	69.9	35.8	34.1	131.8	47.0	21.4	64.7	61.3	18.9
Level of Service	D	C	A	E	D	C	F	D	C	E	E	B
Approach Delay (s)		25.4			38.6			90.9			34.4	
Approach LOS		C			D			F			C	

Intersection Summary				
HCM Average Control Delay	43.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
5: Clairemont Mesa Boulevard & Complex Street

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1026	38	92	1176	41	93	4	49	76	5	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1770	5058		1770	5059			1777	1583		1779	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.59	1.00		0.53	1.00
Satd. Flow (perm)	1770	5058		1770	5059			1091	1583		986	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1115	41	100	1278	45	101	4	53	83	5	90
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	47	0	0	79
Lane Group Flow (vph)	109	1154	0	100	1321	0	0	105	6	0	88	11
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	13.6	93.6		12.9	92.9			16.5	16.5		16.5	16.5
Effective Green, g (s)	13.6	93.6		12.9	92.9			16.5	16.5		16.5	16.5
Actuated g/C Ratio	0.10	0.69		0.10	0.69			0.12	0.12		0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	178	3507		169	3481			133	193		121	193
v/s Ratio Prot	c0.06	0.23		0.06	c0.26							
v/s Ratio Perm								c0.10	0.00		0.09	0.01
v/c Ratio	0.61	0.33		0.59	0.38			0.79	0.03		0.73	0.06
Uniform Delay, d1	58.2	8.2		58.5	8.9			57.6	52.2		57.1	52.4
Progression Factor	1.04	0.49		0.77	1.24			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.7	0.2		4.4	0.3			26.0	0.1		19.4	0.1
Delay (s)	66.0	4.2		49.3	11.3			83.5	52.3		76.5	52.5
Level of Service	E	A		D	B			F	D		E	D
Approach Delay (s)		9.5			13.9			73.1			64.4	
Approach LOS		A			B			E			E	

Intersection Summary				
HCM Average Control Delay	18.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
6: Clairemont Mesa Boulevard & Overland Avenue

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	955	169	201	895	34	203	87	164	77	151	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4970		3433	5085	1583	1770	3193		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4970		3433	5085	1583	1770	3193		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	1038	184	218	973	37	221	95	178	84	164	320
RTOR Reduction (vph)	0	19	0	0	0	17	0	105	0	0	0	148
Lane Group Flow (vph)	147	1203	0	218	973	20	221	168	0	84	164	172
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	10.0	42.0		12.6	44.5	44.5	18.3	55.1		6.6	43.4	43.4
Effective Green, g (s)	10.0	42.0		12.6	44.5	44.5	18.3	55.1		6.6	43.4	43.4
Actuated g/C Ratio	0.07	0.31		0.09	0.33	0.33	0.14	0.41		0.05	0.32	0.32
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	254	1546		320	1676	522	240	1303		87	599	509
v/s Ratio Prot	0.04	c0.24		c0.06	c0.19		c0.12	0.05		0.05	0.09	
v/s Ratio Perm						0.01						c0.11
v/c Ratio	0.58	0.78		0.68	0.58	0.04	0.92	0.13		0.97	0.27	0.34
Uniform Delay, d1	60.5	42.3		59.3	37.5	30.7	57.6	25.0		64.1	34.1	34.9
Progression Factor	1.11	1.18		1.09	1.27	1.93	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.1	3.8		4.8	1.2	0.1	37.2	0.0		84.3	1.1	1.8
Delay (s)	70.2	53.9		69.4	48.7	59.5	94.8	25.0		148.4	35.2	36.7
Level of Service	E	D		E	D	E	F	C		F	D	D
Approach Delay (s)		55.6			52.7			56.2			52.8	
Approach LOS		E			D			E			D	

Intersection Summary				
HCM Average Control Delay	54.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	23.8	
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Ex + Cuml+ Entire Proj PM (Year 2030)
12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	318	923	163	238	538	186	341	596	216	572	466	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4971		3433	4890		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4971		3433	4890		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	346	1003	177	259	585	202	371	648	235	622	507	316
RTOR Reduction (vph)	0	18	0	0	45	0	0	0	148	0	0	155
Lane Group Flow (vph)	346	1162	0	259	742	0	371	648	87	622	507	161
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	18.2	33.2		13.2	28.3		19.8	39.3	39.3	29.7	49.4	49.4
Effective Green, g (s)	18.2	33.2		13.2	28.3		19.8	39.3	39.3	29.7	49.4	49.4
Actuated g/C Ratio	0.13	0.25		0.10	0.21		0.15	0.29	0.29	0.22	0.37	0.37
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	463	1222		336	1025		504	1030	461	755	1295	579
v/s Ratio Prot	c0.10	c0.23		0.08	0.15		0.11	c0.18		c0.18	0.14	
v/s Ratio Perm									0.05			0.10
v/c Ratio	0.75	0.95		0.77	0.72		0.74	0.63	0.19	0.82	0.39	0.28
Uniform Delay, d1	56.2	50.1		59.4	49.7		55.1	41.5	35.9	50.2	31.7	30.2
Progression Factor	1.11	1.62		1.01	0.90		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	13.9		10.3	4.4		5.5	2.9	0.9	7.3	0.9	1.2
Delay (s)	67.5	94.9		70.5	49.0		60.6	44.4	36.8	57.4	32.6	31.4
Level of Service	E	F		E	D		E	D	D	E	C	C
Approach Delay (s)		88.7			54.3			47.8			43.0	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	59.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Ex + Cuml+ Entire Proj PM (Year 2030)
12/20/2012

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1736	59	297	823	139	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1887	64	323	895	151	753
RTOR Reduction (vph)	0	20	0	0	0	0
Lane Group Flow (vph)	1887	44	323	895	151	753
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	76.5	93.7	27.3	108.3	17.2	44.5
Effective Green, g (s)	76.5	93.7	27.3	108.3	17.2	44.5
Actuated g/C Ratio	0.57	0.69	0.20	0.80	0.13	0.33
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2882	1099	694	4079	226	1010
v/s Ratio Prot	c0.37	0.01	0.09	0.18	0.09	c0.15
v/s Ratio Perm		0.02				0.12
v/c Ratio	0.65	0.04	0.47	0.22	0.67	0.75
Uniform Delay, d1	20.2	6.5	47.4	3.2	56.2	40.2
Progression Factor	1.15	1.57	1.11	0.83	1.00	1.00
Incremental Delay, d2	0.8	0.0	0.5	0.1	7.3	3.0
Delay (s)	23.8	10.2	53.0	2.8	63.5	43.2
Level of Service	C	B	D	A	E	D
Approach Delay (s)	23.4			16.1	46.6	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1679	202	194	811	164	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1825	220	211	882	178	460
RTOR Reduction (vph)	0	0	20	0	0	0	6
Lane Group Flow (vph)	0	1825	200	211	882	178	454
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		77.4	77.4	23.3	105.7	18.9	42.2
Effective Green, g (s)		77.4	77.4	23.3	105.7	18.9	42.2
Actuated g/C Ratio		0.57	0.57	0.17	0.78	0.14	0.31
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2029	908	305	3981	248	495
v/s Ratio Prot		c0.52		0.12	0.17	0.10	c0.16
v/s Ratio Perm			0.13				0.13
v/c Ratio		0.90	0.22	0.69	0.22	0.72	0.92
Uniform Delay, d1		25.4	14.1	52.5	3.8	55.5	44.7
Progression Factor		0.91	0.78	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.2	0.4	6.6	0.1	9.5	21.7
Delay (s)		28.2	11.4	59.1	4.0	65.0	66.4
Level of Service		C	B	E	A	E	E
Approach Delay (s)		26.4			14.6	66.0	
Approach LOS		C			B	E	

Intersection Summary			
HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1308	794	207	804	0	0	0	0	777	7	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1606	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1606	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1422	863	225	874	0	0	0	0	845	8	271
RTOR Reduction (vph)	0	0	442	0	0	0	0	0	0	0	3	111
Lane Group Flow (vph)	0	1422	421	225	874	0	0	0	0	439	438	133
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		39.0	39.0	6.0	49.0					23.0	23.0	23.0
Effective Green, g (s)		39.0	39.0	6.0	49.0					23.0	23.0	23.0
Actuated g/C Ratio		0.49	0.49	0.08	0.61					0.29	0.29	0.29
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1725	1359	257	2168					483	462	432
v/s Ratio Prot		c0.40		c0.07	0.25					0.26	c0.27	
v/s Ratio Perm			0.15									0.09
v/c Ratio		0.82	0.31	0.88	0.40					0.91	0.95	0.31
Uniform Delay, d1		17.6	12.4	36.6	8.0					27.5	27.9	22.3
Progression Factor		1.00	1.00	1.28	0.68					1.00	1.00	1.00
Incremental Delay, d2		3.3	0.1	22.6	0.5					20.7	28.9	0.4
Delay (s)		20.9	12.5	69.4	5.9					48.2	56.8	22.7
Level of Service		C	B	E	A					D	E	C
Approach Delay (s)		17.7			18.9			0.0			46.0	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	591	1494	0	0	542	86	469	0	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3467		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3467		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	642	1624	0	0	589	93	510	0	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	30	0	0	0
Lane Group Flow (vph)	642	1624	0	0	668	0	510	0	163	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	19.7	53.9			30.0		16.1		16.1			
Effective Green, g (s)	19.7	53.9			30.0		16.1		16.1			
Actuated g/C Ratio	0.25	0.67			0.38		0.20		0.20			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	845	2384			1300		691		319			
v/s Ratio Prot	c0.19	c0.46			0.19		c0.15					
v/s Ratio Perm									0.10			
v/c Ratio	0.76	0.68			0.51		0.74		0.51			
Uniform Delay, d1	28.0	7.9			19.4		30.0		28.4			
Progression Factor	0.97	1.63			1.00		1.00		1.00			
Incremental Delay, d2	1.9	0.8			1.5		4.1		1.3			
Delay (s)	29.0	13.6			20.8		34.1		29.7			
Level of Service	C	B			C		C		C			
Approach Delay (s)		18.0			20.8			32.9			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
12: Lightwave Avenue & Overland Avenue

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	178	80	69	201	211	86	176	107	286	189	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3374		1770	3267		1770	3339		1770	3366	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3374		1770	3267		1770	3339		1770	3366	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	193	87	75	218	229	93	191	116	311	205	99
RTOR Reduction (vph)	0	61	0	0	188	0	0	95	0	0	58	0
Lane Group Flow (vph)	142	219	0	75	259	0	93	212	0	311	246	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.8	13.0		5.8	11.0		6.4	11.0		13.1	17.7	
Effective Green, g (s)	7.8	13.0		5.8	11.0		6.4	11.0		13.1	17.7	
Actuated g/C Ratio	0.13	0.21		0.09	0.18		0.10	0.18		0.21	0.29	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	224	713		167	584		184	597		377	969	
v/s Ratio Prot	c0.08	0.06		0.04	c0.08		0.05	c0.06		c0.18	0.07	
v/s Ratio Perm												
v/c Ratio	0.63	0.31		0.45	0.44		0.51	0.35		0.82	0.25	
Uniform Delay, d1	25.5	20.5		26.3	22.5		26.1	22.1		23.1	16.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.3		0.7	0.6		0.8	0.4		13.0	0.2	
Delay (s)	29.8	20.7		27.0	23.1		26.9	22.5		36.2	17.0	
Level of Service	C	C		C	C		C	C		D	B	
Approach Delay (s)		23.8			23.7			23.5			26.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	61.5	Sum of lost time (s)	18.6
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	81	602	1062	780	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3527	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	88	654	1154	848	20
RTOR Reduction (vph)	0	79	0	0	1	0
Lane Group Flow (vph)	88	9	654	1154	867	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	10.3	10.3	40.9	78.4	33.3	
Effective Green, g (s)	10.3	10.3	40.9	78.4	33.3	
Actuated g/C Ratio	0.10	0.10	0.41	0.78	0.33	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	182	163	724	2775	1174	
v/s Ratio Prot	c0.05		c0.37	0.33	c0.25	
v/s Ratio Perm		0.01				
v/c Ratio	0.48	0.06	0.90	0.42	0.74	
Uniform Delay, d1	42.3	40.5	27.7	3.5	29.5	
Progression Factor	1.00	1.00	0.91	3.25	1.00	
Incremental Delay, d2	2.0	0.1	4.0	0.1	4.2	
Delay (s)	44.4	40.6	29.3	11.4	33.7	
Level of Service	D	D	C	B	C	
Approach Delay (s)	42.5			17.8	33.7	
Approach LOS	D			B	C	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	5	233	0	0	0	0	1507	404	415	445	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1776	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1776	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	5	253	0	0	0	0	1638	439	451	484	0
RTOR Reduction (vph)	0	0	218	0	0	0	0	0	202	0	0	0
Lane Group Flow (vph)	0	175	35	0	0	0	0	1638	237	451	484	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		13.8	13.8					44.6	44.6	26.1	74.9	
Effective Green, g (s)		13.8	13.8					44.6	44.6	26.1	74.9	
Actuated g/C Ratio		0.14	0.14					0.45	0.45	0.26	0.75	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		245	385					1578	706	462	2651	
v/s Ratio Prot								c0.46		c0.25	0.14	
v/s Ratio Perm		0.10	0.01						0.15			
v/c Ratio		0.71	0.09					1.04	0.34	0.98	0.18	
Uniform Delay, d1		41.2	37.6					27.7	18.1	36.6	3.6	
Progression Factor		1.00	1.00					1.00	1.00	1.47	0.34	
Incremental Delay, d2		9.5	0.1					33.2	1.3	29.1	0.1	
Delay (s)		50.7	37.7					60.9	19.3	83.1	1.4	
Level of Service		D	D					E	B	F	A	
Approach Delay (s)		43.0			0.0			52.1			40.8	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM Average Control Delay	47.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
15: Kearny Villa Road & Ruffin Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	379	4	22	43	32	82	29	1447	4	14	558	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1687	1583	1770	1662		1770	3538		3433	3455	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1687	1583	1770	1662		1770	3538		3433	3455	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	412	4	24	47	35	89	32	1573	4	15	607	115
RTOR Reduction (vph)	0	0	19	0	83	0	0	0	0	0	21	0
Lane Group Flow (vph)	206	210	5	47	41	0	32	1577	0	15	701	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.1	12.1	12.1	4.1	4.1		1.8	28.0		1.1	27.3	
Effective Green, g (s)	12.1	12.1	12.1	4.1	4.1		1.8	28.0		1.1	27.3	
Actuated g/C Ratio	0.20	0.20	0.20	0.07	0.07		0.03	0.46		0.02	0.45	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	332	333	312	118	111		52	1616		62	1539	
v/s Ratio Prot	0.12	c0.12		c0.03	0.02		c0.02	c0.45		0.00	0.20	
v/s Ratio Perm			0.00									
v/c Ratio	0.62	0.63	0.02	0.40	0.37		0.62	0.98		0.24	0.46	
Uniform Delay, d1	22.5	22.6	19.8	27.4	27.4		29.4	16.3		29.7	11.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	3.9	0.0	2.2	2.1		19.7	16.8		2.0	0.2	
Delay (s)	26.1	26.4	19.8	29.6	29.4		49.1	33.1		31.7	12.0	
Level of Service	C	C	B	C	C		D	C		C	B	
Approach Delay (s)		25.9			29.5			33.5			12.4	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	26.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
16: Chesapeake Drive & Ruffin Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	20	152	98	55	167	67	1096	35	37	569	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1789	1583		1805	1583	1770	3523		1770	3497	
Flt Permitted		0.65	1.00		0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1220	1583		1365	1583	1770	3523		1770	3497	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	22	165	107	60	182	73	1191	38	40	618	53
RTOR Reduction (vph)	0	0	134	0	0	107	0	2	0	0	6	0
Lane Group Flow (vph)	0	124	31	0	167	75	73	1227	0	40	665	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		11.2	11.2		11.8	11.8	4.1	31.2		1.8	28.9	
Effective Green, g (s)		11.2	11.2		11.8	11.8	4.1	31.2		1.8	28.9	
Actuated g/C Ratio		0.19	0.19		0.20	0.20	0.07	0.53		0.03	0.49	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		230	298		271	314	122	1850		54	1701	
v/s Ratio Prot							c0.04	c0.35		0.02	0.19	
v/s Ratio Perm		0.10	0.02		c0.12	0.05						
v/c Ratio		0.54	0.10		0.62	0.24	0.60	0.66		0.74	0.39	
Uniform Delay, d1		21.8	19.9		21.7	20.0	26.9	10.3		28.6	9.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2	0.1		2.9	0.1	5.2	1.1		37.5	0.2	
Delay (s)		23.0	20.0		24.6	20.2	32.0	11.3		66.1	9.9	
Level of Service		C	C		C	C	C	B		E	A	
Approach Delay (s)		21.3			22.3			12.5			13.1	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	61.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
17: Hazard Way & Ruffin Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	0	36	8	0	9	13	927	2	1	733	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1690		3433	3538		1770	3533	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1690		3433	3538		1770	3533	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	39	9	0	10	14	1008	2	1	797	9
RTOR Reduction (vph)	0	35	0	0	10	0	0	0	0	0	1	0
Lane Group Flow (vph)	83	4	0	0	9	0	14	1010	0	1	805	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Effective Green, g (s)	5.8	5.8			0.9		0.5	24.1		0.5	24.1	
Actuated g/C Ratio	0.11	0.11			0.02		0.01	0.47		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	202	181			30		34	1678		17	1676	
v/s Ratio Prot	c0.05	0.00			c0.01		c0.00	c0.29		0.00	0.23	
v/s Ratio Perm												
v/c Ratio	0.41	0.02			0.31		0.41	0.60		0.06	0.48	
Uniform Delay, d1	20.9	20.0			24.6		25.0	9.8		24.9	9.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0			2.1		2.9	1.0		0.5	0.6	
Delay (s)	21.4	20.0			26.7		27.9	10.9		25.4	9.7	
Level of Service	C	C			C		C	B		C	A	
Approach Delay (s)		21.0			26.7			11.1			9.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	19.5
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
18: Farnham St & Ruffin Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	6	150	151	30	66	70	797	23	4	990	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1777	1583		1788	1583	3433	3524		1770	3514	
Flt Permitted		0.58	1.00		0.65	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1082	1583		1207	1583	3433	3524		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	7	163	164	33	72	76	866	25	4	1076	53
RTOR Reduction (vph)	0	0	125	0	0	55	0	2	0	0	4	0
Lane Group Flow (vph)	0	174	38	0	197	17	76	889	0	4	1125	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		13.2	13.2		13.2	13.2	2.2	28.1		0.7	26.6	
Effective Green, g (s)		13.2	13.2		13.2	13.2	2.2	28.1		0.7	26.6	
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.04	0.50		0.01	0.47	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		252	369		281	369	133	1750		22	1651	
v/s Ratio Prot							c0.02	0.25		0.00	c0.32	
v/s Ratio Perm		0.16	0.02		c0.16	0.01						
v/c Ratio		0.69	0.10		0.70	0.05	0.57	0.51		0.18	0.68	
Uniform Delay, d1		19.8	17.0		19.9	16.8	26.7	9.6		27.7	11.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.4	0.0		6.3	0.0	3.6	0.6		1.4	1.7	
Delay (s)		26.3	17.1		26.2	16.8	30.4	10.2		29.1	13.4	
Level of Service		C	B		C	B	C	B		C	B	
Approach Delay (s)		21.8			23.7			11.8			13.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	101	1052	43	0	994
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	110	1143	47	0	1080
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.86	0.81			0.81	
vC, conflicting volume	1684	572			1190	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	939	0			763	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	87			100	
cM capacity (veh/h)	226	877			684	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	572	572	47	540	540
Volume Left	0	0	0	0	0	0
Volume Right	110	0	0	47	0	0
cSH	877	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.34	0.34	0.03	0.32	0.32
Queue Length 95th (ft)	11	0	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.7	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		42.0%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	205	88	292	131	163	298	238	729	54	170	669	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1682		3433	3502		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1682		3433	3502		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	96	317	142	177	324	259	792	59	185	727	201
RTOR Reduction (vph)	0	0	55	0	61	0	0	5	0	0	0	121
Lane Group Flow (vph)	223	96	262	142	440	0	259	846	0	185	727	80
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	9.1	22.2	34.6	17.3	31.0		12.4	29.6		13.8	31.0	40.1
Effective Green, g (s)	9.1	22.2	34.6	17.3	31.0		12.4	29.6		13.8	31.0	40.1
Actuated g/C Ratio	0.09	0.22	0.34	0.17	0.31		0.12	0.29		0.14	0.31	0.40
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	309	409	542	303	516		421	1026		242	1086	628
v/s Ratio Prot	c0.06	0.05	0.06	0.08	c0.26		0.08	c0.24		c0.10	0.21	0.01
v/s Ratio Perm			0.11									0.04
v/c Ratio	0.72	0.23	0.48	0.47	0.85		0.62	0.82		0.76	0.67	0.13
Uniform Delay, d1	44.7	32.4	26.2	37.7	32.9		42.0	33.3		42.0	30.5	19.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.1	0.3	0.7	1.1	12.9		2.7	5.5		13.4	1.6	0.1
Delay (s)	52.8	32.7	26.8	38.9	45.7		44.7	38.8		55.4	32.1	19.4
Level of Service	D	C	C	D	D		D	D		E	C	B
Approach Delay (s)		36.8			44.2			40.2			33.7	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM Average Control Delay		38.2	HCM Level of Service	D
HCM Volume to Capacity ratio		0.81		
Actuated Cycle Length (s)		101.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization		78.6%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
21: Spectrum Center Boulevard & Ruffin Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	0	567	16	4	16	237	693	4	15	965	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Flt Permitted	0.95		1.00		0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1790	1583	3433	3536		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	0	616	17	4	17	258	753	4	16	1049	77
RTOR Reduction (vph)	0	0	189	0	0	16	0	0	0	0	0	22
Lane Group Flow (vph)	170	0	427	0	21	1	258	757	0	16	1049	55
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	9.4		19.5		3.7	3.7	10.1	43.6		0.7	34.2	34.2
Effective Green, g (s)	9.4		19.5		3.7	3.7	10.1	43.6		0.7	34.2	34.2
Actuated g/C Ratio	0.12		0.25		0.05	0.05	0.13	0.56		0.01	0.44	0.44
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	416		398		85	76	447	1989		16	1562	699
v/s Ratio Prot	0.05		c0.14		c0.01		0.08	0.21		0.01	c0.30	
v/s Ratio Perm			0.13			0.00						0.03
v/c Ratio	0.41		1.07		0.25	0.01	0.58	0.38		1.00	0.67	0.08
Uniform Delay, d1	31.5		29.0		35.6	35.2	31.7	9.4		38.4	17.2	12.5
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7		66.2		1.5	0.1	1.8	0.1		225.0	1.2	0.0
Delay (s)	32.1		95.2		37.1	35.2	33.5	9.6		263.4	18.3	12.6
Level of Service	C		F		D	D	C	A		F	B	B
Approach Delay (s)		81.6			36.2			15.6			21.4	
Approach LOS		F			D			B			C	

Intersection Summary			
HCM Average Control Delay	35.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	19.2
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Ex + Cuml+ Entire Proj PM (Year 2030)
22: Balboa Avenue & Ruffin Road

12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	918	167	109	503	330	430	522	361	698	654	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	998	182	118	547	359	467	567	392	759	711	257
RTOR Reduction (vph)	0	21	0	0	0	97	0	0	105	0	0	142
Lane Group Flow (vph)	163	1159	0	118	547	262	467	567	287	759	711	115
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	7.7	31.7		9.3	33.5	50.3	18.4	31.6	31.6	16.8	30.1	30.1
Effective Green, g (s)	7.7	31.7		9.3	33.5	50.3	18.4	31.6	31.6	16.8	30.1	30.1
Actuated g/C Ratio	0.07	0.29		0.08	0.30	0.46	0.17	0.29	0.29	0.15	0.27	0.27
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	124	1433		150	1550	1276	575	1018	455	525	969	434
v/s Ratio Prot	c0.09	c0.23		0.07	0.11	0.03	0.14	0.16		c0.22	c0.20	
v/s Ratio Perm						0.06			0.18			0.07
v/c Ratio	1.31	0.81		0.79	0.35	0.21	0.81	0.56	0.63	1.45	0.73	0.26
Uniform Delay, d1	51.1	36.3		49.3	29.8	17.8	44.1	33.2	34.1	46.6	36.3	31.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	187.4	3.5		23.2	0.1	0.1	8.6	0.7	2.7	211.1	2.9	0.3
Delay (s)	238.5	39.8		72.6	29.9	17.9	52.6	33.9	36.8	257.7	39.2	31.6
Level of Service	F	D		E	C	B	D	C	D	F	D	C
Approach Delay (s)		63.9			30.6			40.8			134.1	
Approach LOS		E			C			D			F	

Intersection Summary			
HCM Average Control Delay	73.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	109.9	Sum of lost time (s)	20.4
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

Ex + Cuml+ Entire Proj PM (Year 2030)
12/20/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1983	36	47	812	86	33	7	484	492	15	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5072		1770	6316			1790	1583	1770	1619	
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00	0.73	1.00	
Satd. Flow (perm)	1770	5072		1770	6316			1435	1583	1357	1619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	2155	39	51	883	93	36	8	526	535	16	109
RTOR Reduction (vph)	0	2	0	0	15	0	0	0	59	0	66	0
Lane Group Flow (vph)	48	2192	0	51	961	0	0	44	467	535	59	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	6.6	52.0		3.6	50.0			47.1	47.1	47.1	47.1	
Effective Green, g (s)	6.6	52.0		3.6	50.0			47.1	47.1	47.1	47.1	
Actuated g/C Ratio	0.06	0.44		0.03	0.42			0.40	0.40	0.40	0.40	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	98	2214		54	2652			567	626	537	640	
v/s Ratio Prot	0.03	c0.43		c0.03	0.15						0.04	
v/s Ratio Perm								0.03	0.30	c0.39		
v/c Ratio	0.49	0.99		0.94	0.36			0.08	0.75	1.00	0.09	
Uniform Delay, d1	54.6	33.3		57.7	23.6			22.5	30.9	35.9	22.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	16.8		101.4	0.1			0.1	4.8	37.6	0.1	
Delay (s)	58.4	50.1		159.0	23.7			22.5	35.7	73.5	22.7	
Level of Service	E	D		F	C			C	D	E	C	
Approach Delay (s)		50.3			30.4			34.7			63.9	
Approach LOS		D			C			C			E	

Intersection Summary				
HCM Average Control Delay	45.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	110.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

Ex + Cuml+ Entire Proj PM (Year 2030)
12/20/2012

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	81	181	263	27	63	189
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	197	286	29	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	315				673	301
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315				673	301
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				82	72
cM capacity (veh/h)	1245				391	739

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	88	197	315	274
Volume Left	88	0	0	68
Volume Right	0	0	29	205
cSH	1245	1700	1700	985
Volume to Capacity	0.07	0.12	0.19	0.28
Queue Length 95th (ft)	6	0	0	29
Control Delay (s)	8.1	0.0	0.0	12.8
Lane LOS	A			B
Approach Delay (s)	2.5		0.0	12.8
Approach LOS				B

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	186	222	16	38	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	202	241	17	41	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	259				487	250
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	259				487	250
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	95
cM capacity (veh/h)	1306				532	789

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	202	259	83
Volume Left	17	0	0	41
Volume Right	0	0	17	41
cSH	1306	1700	1700	1065
Volume to Capacity	0.01	0.12	0.15	0.08
Queue Length 95th (ft)	1	0	0	6
Control Delay (s)	7.8	0.0	0.0	11.1
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	11.1
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		

ILV ANALYSIS WORKSHEETS

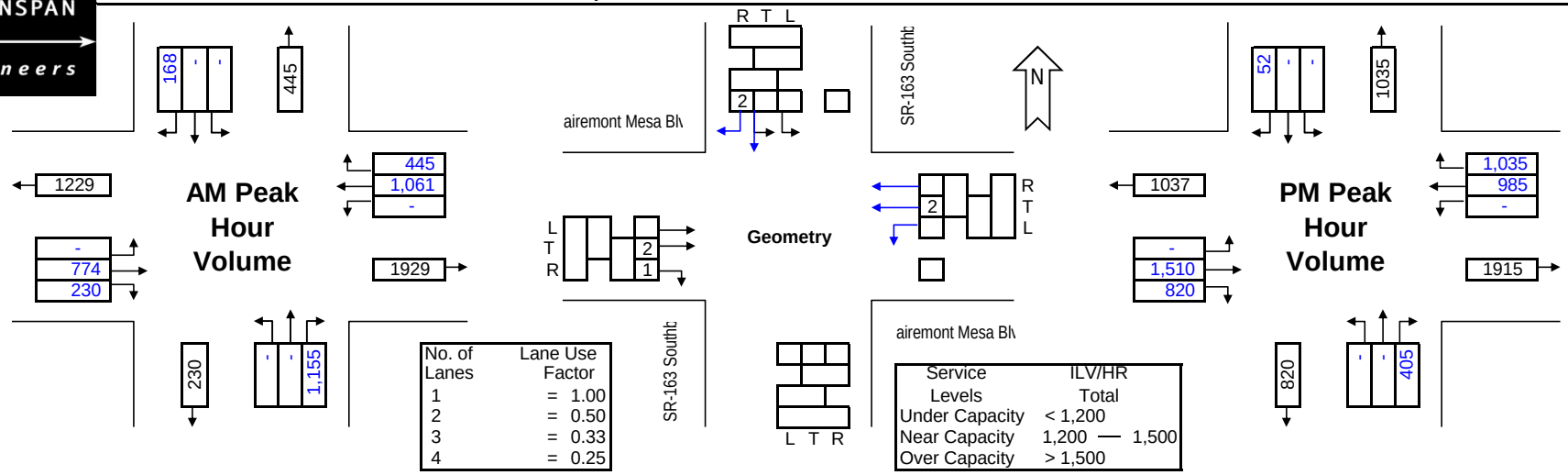
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Entire Proj
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



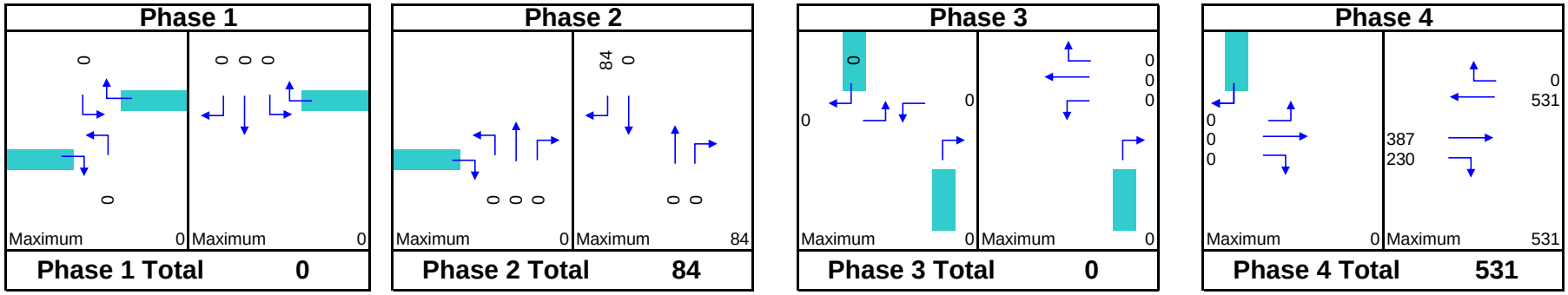
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 615

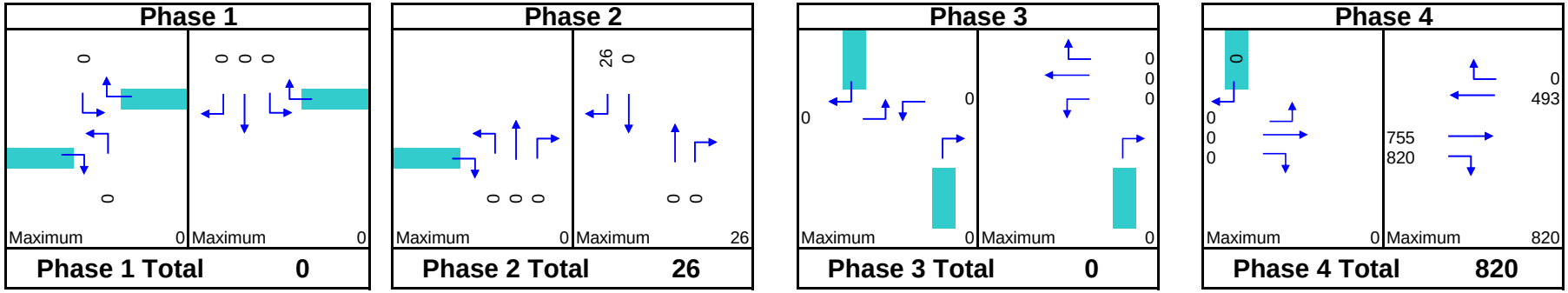
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 846

Service Level: **Under Capacity**



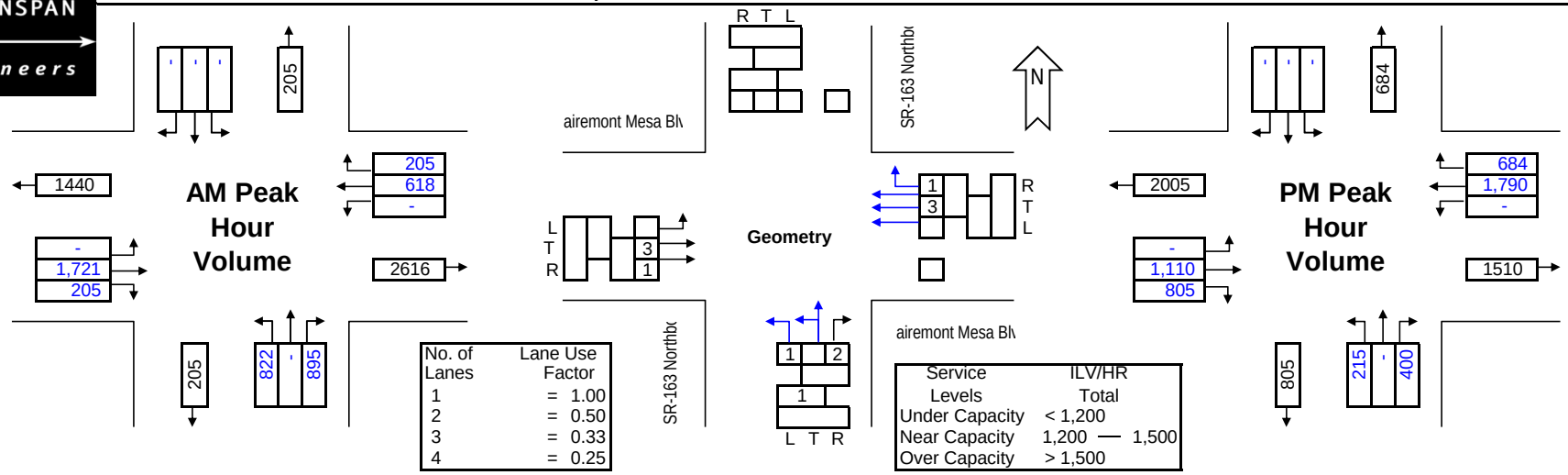
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Entire Proj
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



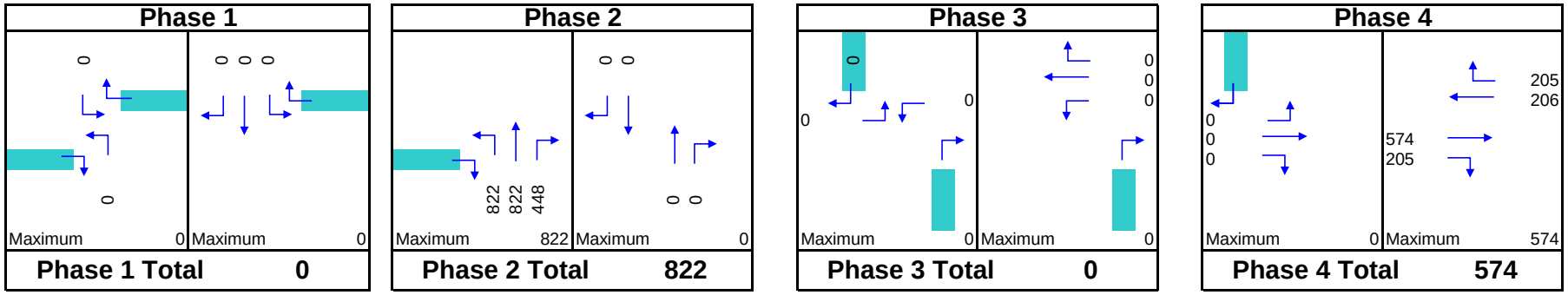
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1396

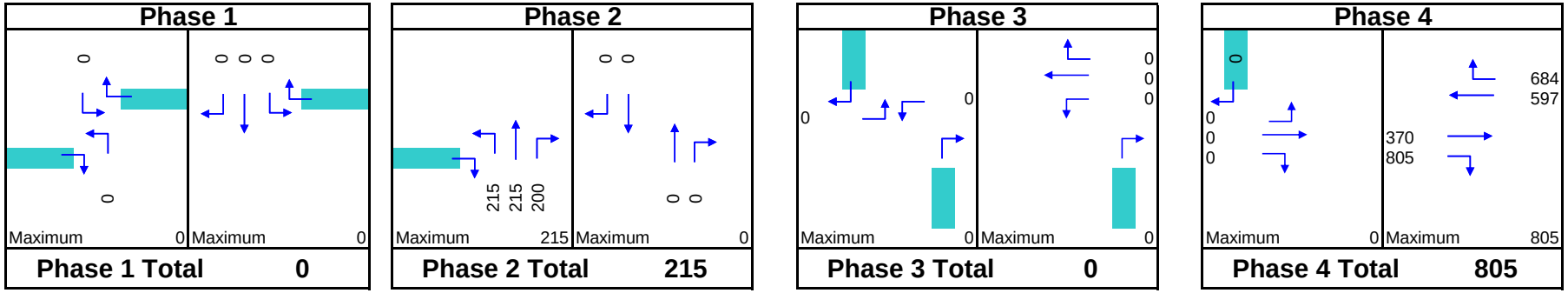
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1020

Service Level: **Under Capacity**



LINSCOTT LAW & GREENSPAN engineers

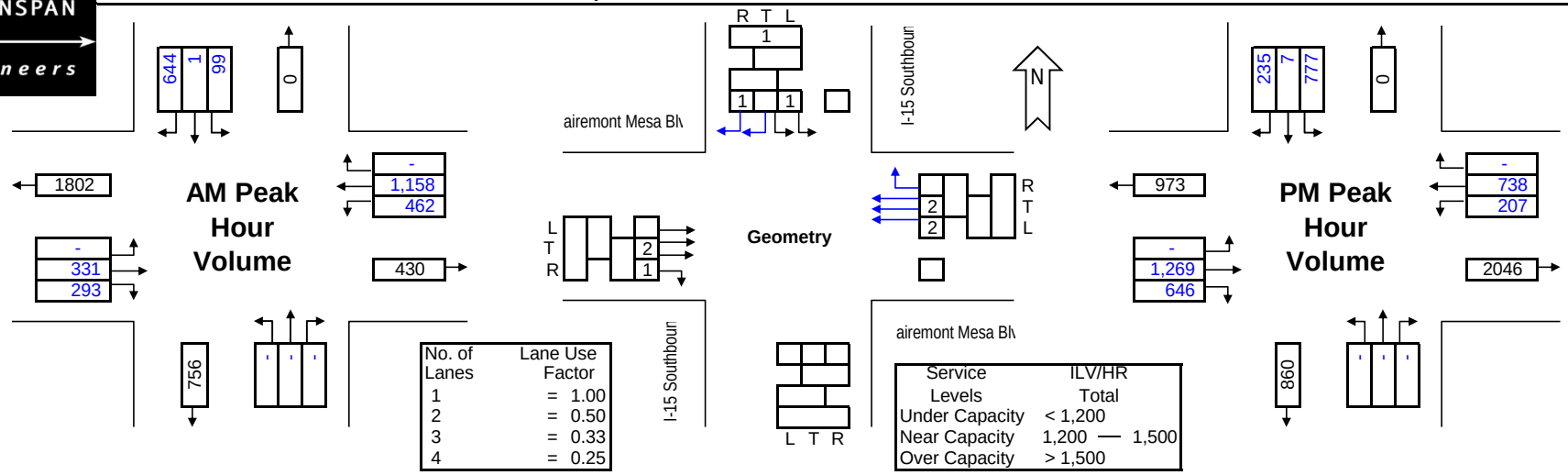
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Entire Proj
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



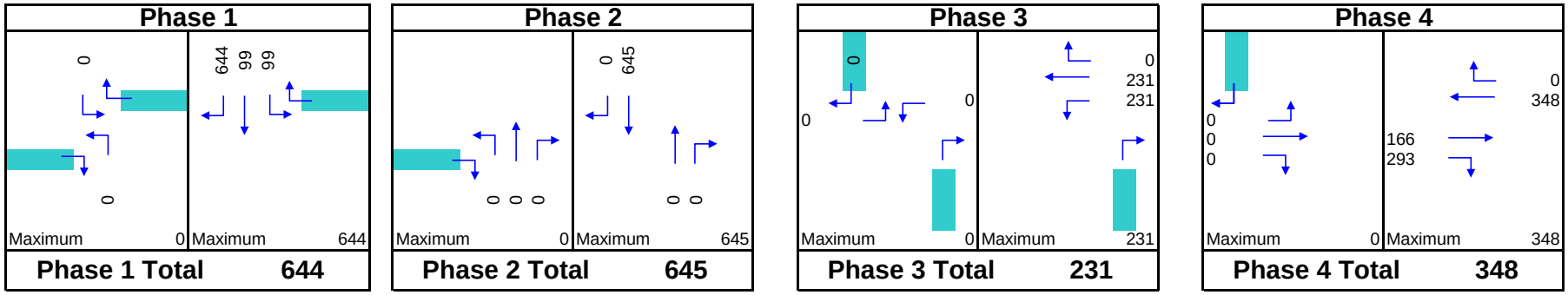
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1868

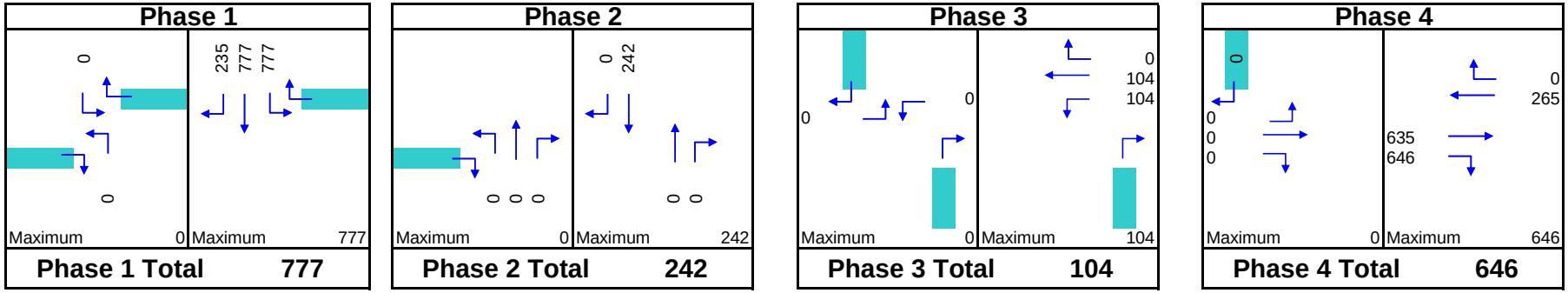
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1769

Service Level: **Over Capacity**



LINSCOTT LAW & GREENSPAN engineers

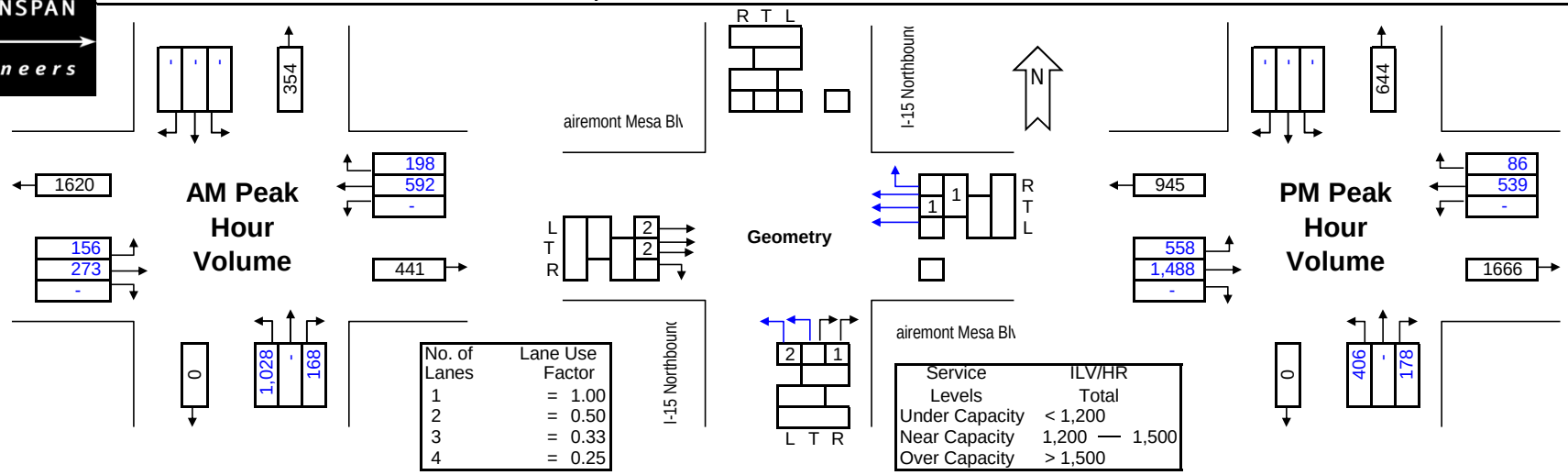
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Entire Proj
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



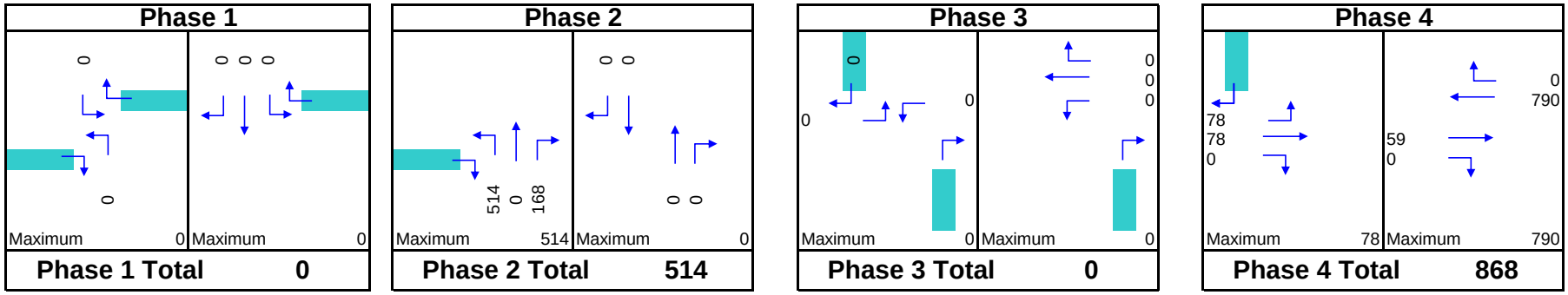
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1382

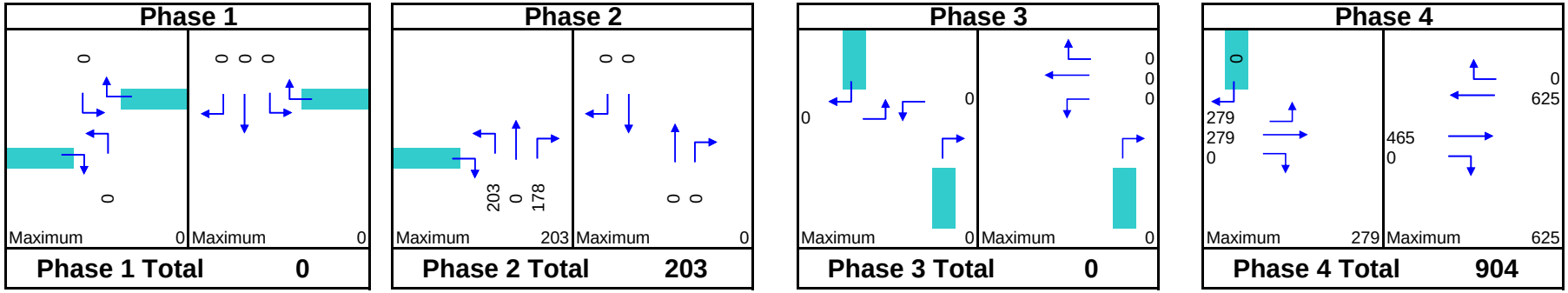
Service Level: **Near Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1107

Service Level: **Under Capacity**



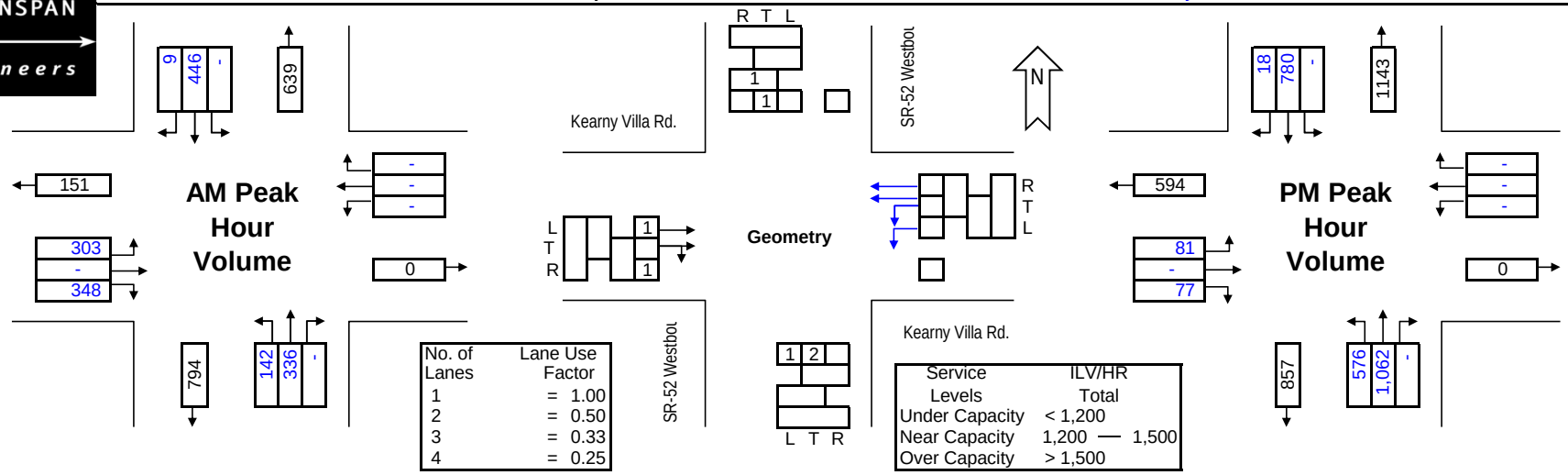
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Entire Proj
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps N/S
at Kearny Villa Rd. E/W



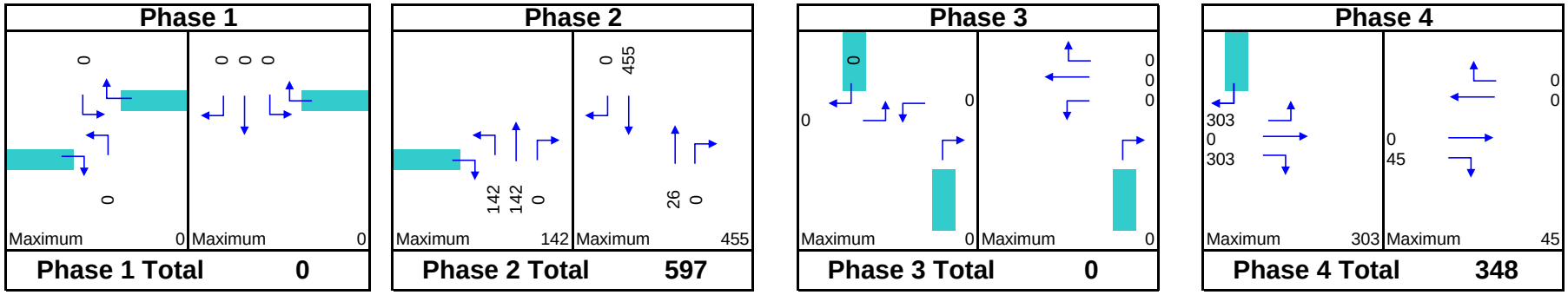
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 945

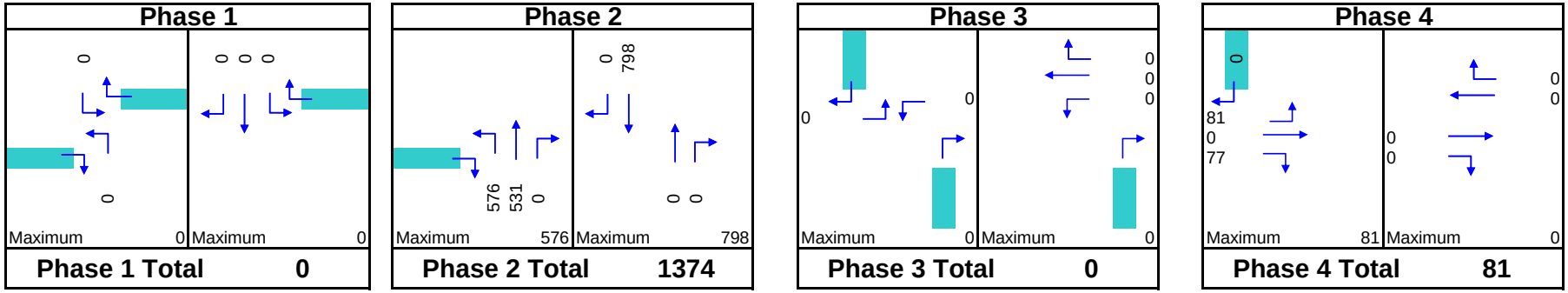
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1455

Service Level: **Near Capacity**



LINSCOTT LAW & GREENSPAN engineers

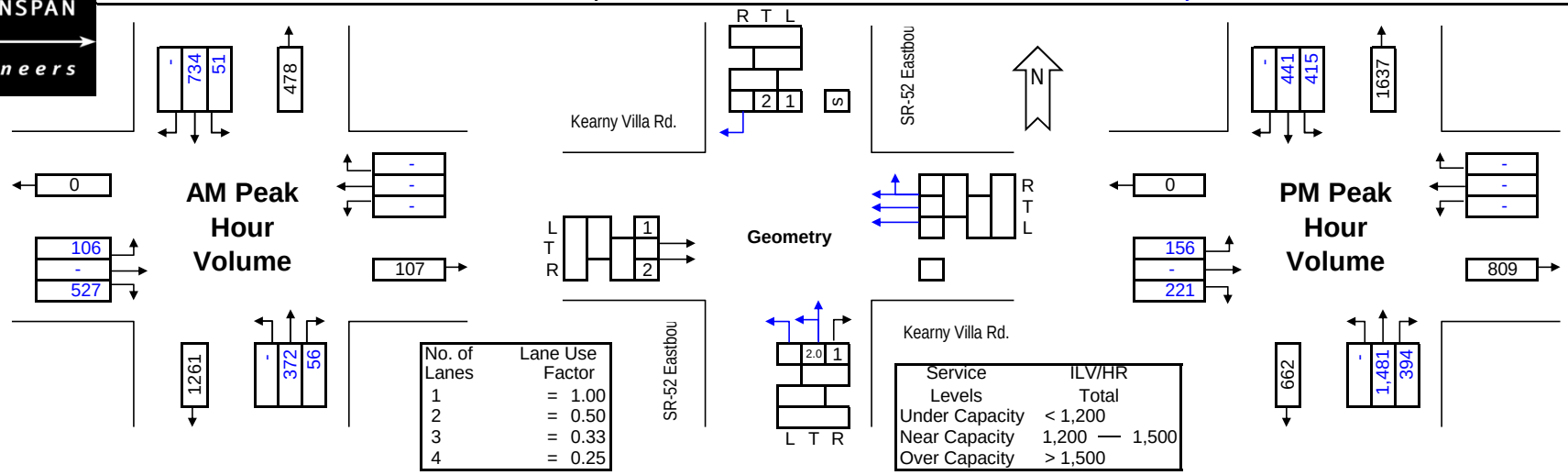
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Ex + CP + Entire Proj
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps at Kearny Villa Rd.

N/S
E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

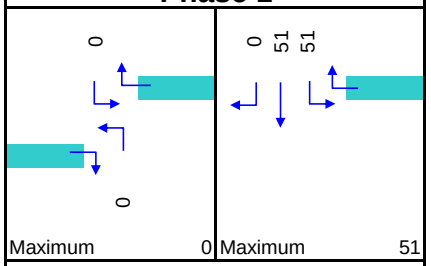
Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 817

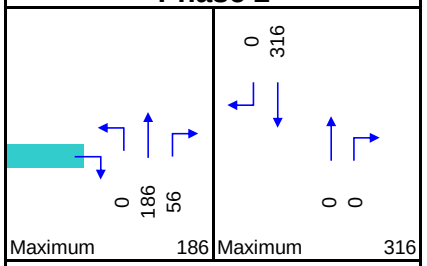
Service Level: **Under Capacity**

Phase 1



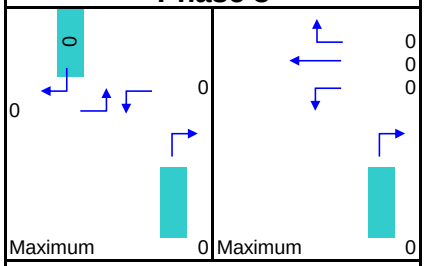
Phase 1 Total 51

Phase 2



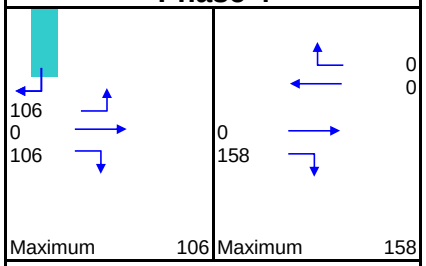
Phase 2 Total 502

Phase 3



Phase 3 Total 0

Phase 4



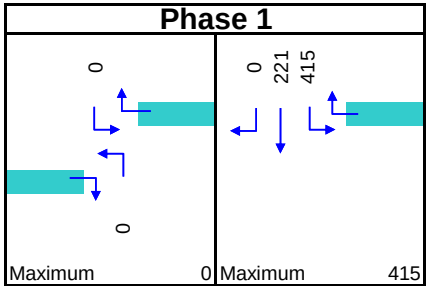
Phase 4 Total 264

PM Peak Hour Analysis

Total Crictical Lane Volume 1312

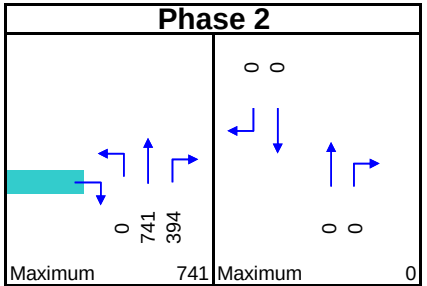
Service Level: **Near Capacity**

Phase 1



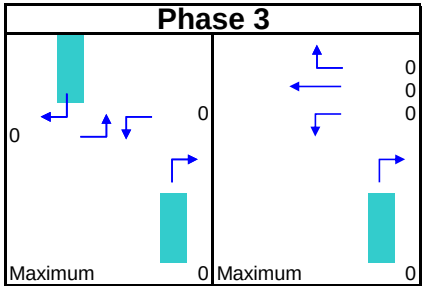
Phase 1 Total 415

Phase 2



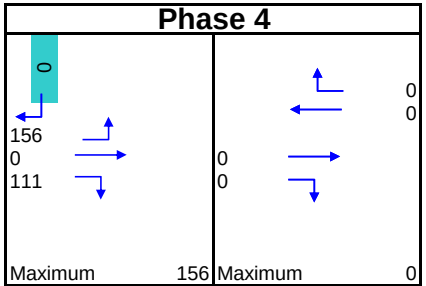
Phase 2 Total 741

Phase 3



Phase 3 Total 0

Phase 4



Phase 4 Total 156

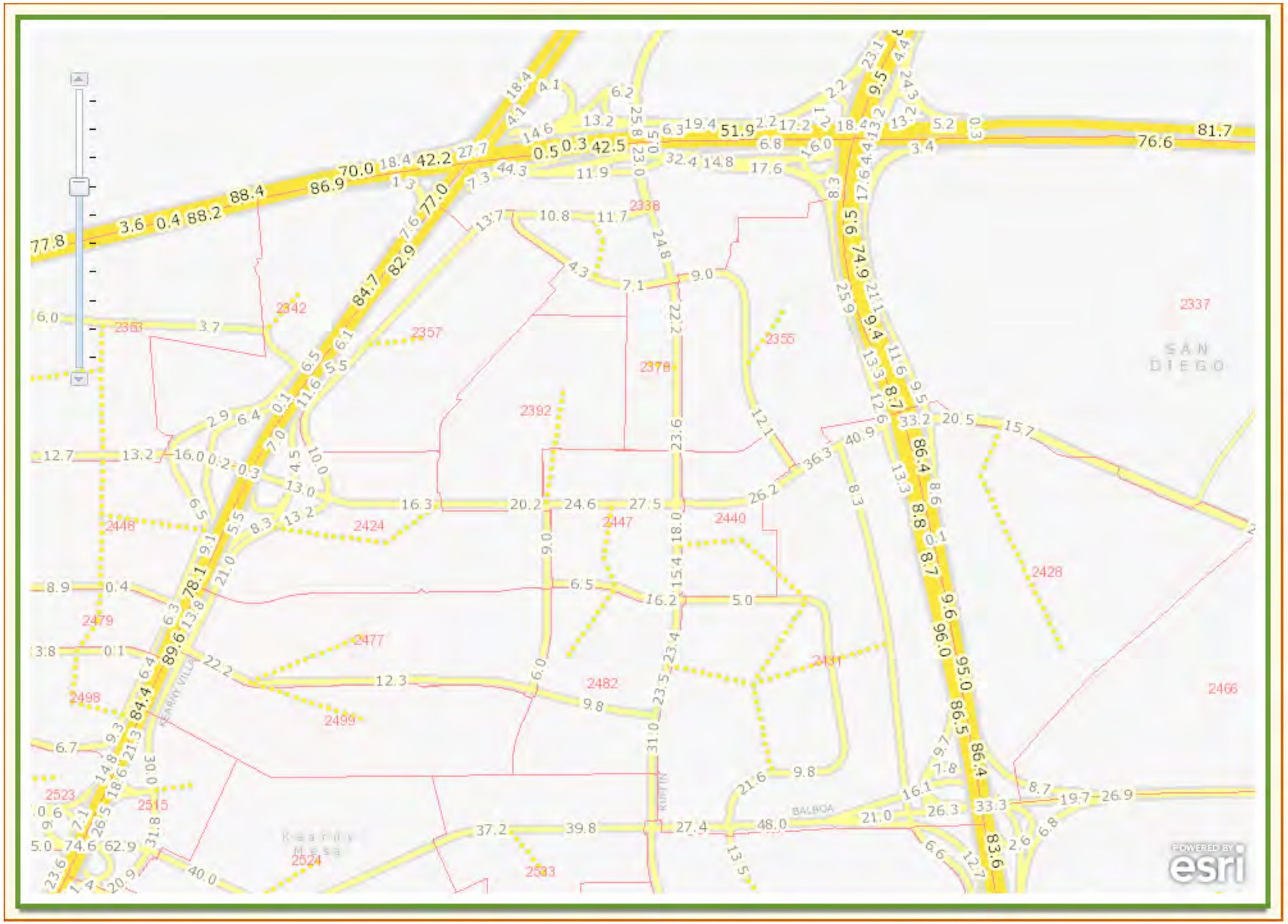
Table X
Existing + Cuml Projects + Project PH I ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	615	Under Capacity
	PM	846	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,396	Near Capacity
	PM	1,020	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	1,868	Over Capacity
	PM	1,769	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,382	Near Capacity
	PM	1,107	Under Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	945	Under Capacity
	PM	1,455	Near Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	817	Under Capacity
	PM	1,312	Near Capacity

APPENDIX I

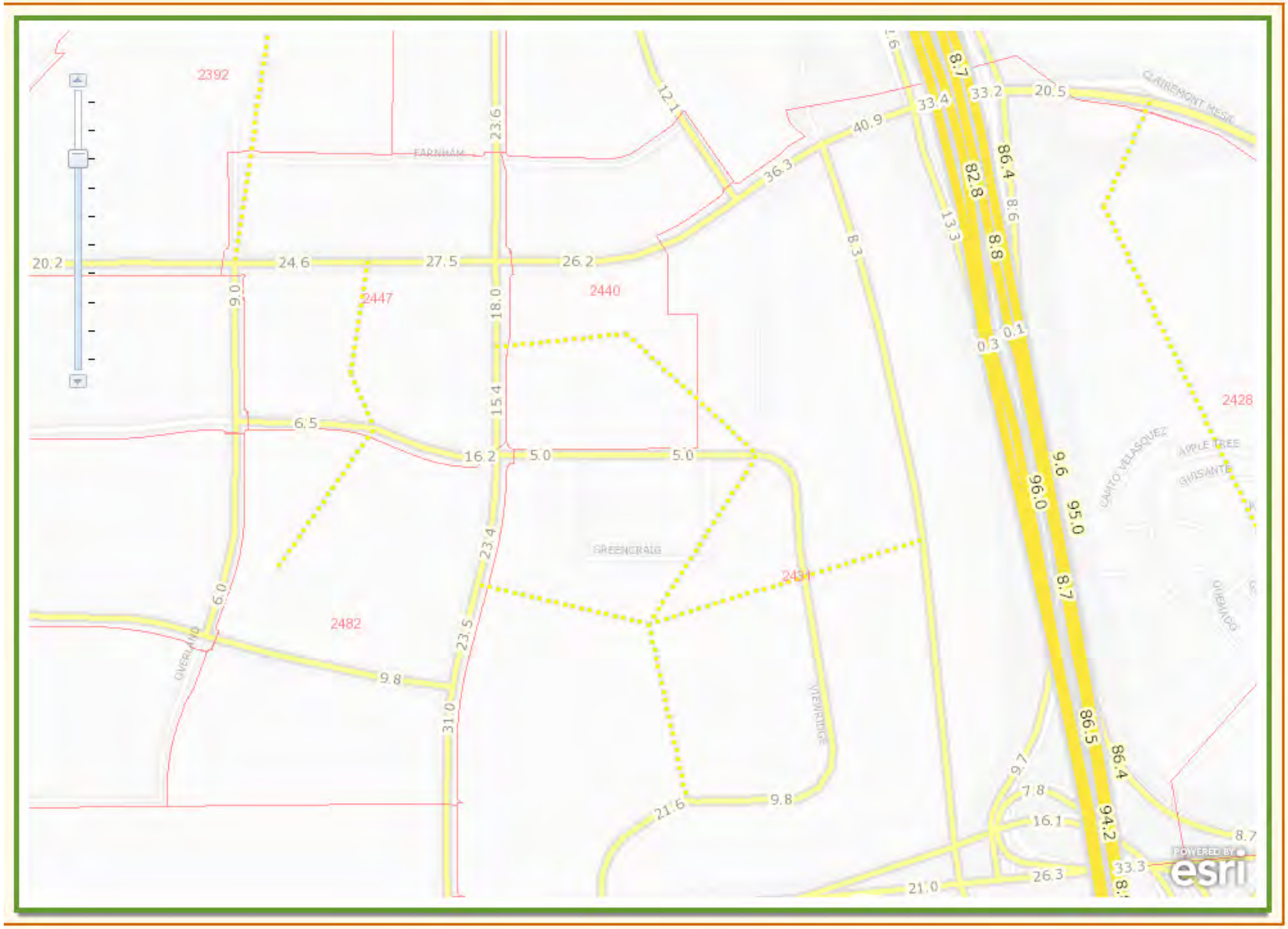
YEAR 2035 SANDAG VOLUME PLOT AND TAZ MAP

Year 2035 Volumes



SANDAG Series 12 Year 2035 ADT Volumes

TAZ Map


2392
FARNHAM
2447
2440
2428
CLAIREMONT MESA
CANTO VELASQUEZ
APPLE TREE
GUISANTE
GREENCRAIG
2431
2482
OVERLAND
VIEWRIDGE
QUEMADO
20.2
24.6
27.5
26.2
6.5
16.2
5.0
5.0
9.8
21.6
9.8
21.0
26.3
16.1
7.8
9.7
33.3
94.2
86.5
86.4
8.7
95.0
96.0
9.6
8.7
82.8
8.8
86.4
8.6
13.3
8.3
0.3
0.1
40.9
36.3
33.4
33.2
20.5
12.1
23.6
18.0
15.4
23.4
23.5
31.0
9.0
6.0
POWERED BY esri

APPENDIX J

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS - YEAR 2035 WITHOUT PROJECT

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1170	25	300	1640	210	25	10	200	130	15	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.86	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	4999		1770	1530	1504	3433	3130	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	4999		1770	1530	1504	3433	3130	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1272	27	326	1783	228	27	11	217	141	16	54
RTOR Reduction (vph)	0	0	11	0	11	0	0	96	62	0	47	0
Lane Group Flow (vph)	43	1272	16	326	2000	0	27	19	51	141	23	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	6.3	58.8	66.6	14.7	66.6		2.5	8.4	23.1	8.9	15.1	
Effective Green, g (s)	6.3	58.8	66.6	14.7	66.6		2.5	8.4	23.1	8.9	15.1	
Actuated g/C Ratio	0.06	0.53	0.61	0.13	0.61		0.02	0.08	0.21	0.08	0.14	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	101	2718	958	459	3027		40	117	316	278	430	
v/s Ratio Prot	0.02	0.25		c0.09	c0.40		0.02	0.01	c0.02	c0.04	0.01	
v/s Ratio Perm			0.01						0.01			
v/c Ratio	0.43	0.47	0.02	0.71	0.66		0.68	0.16	0.16	0.51	0.05	
Uniform Delay, d1	50.1	15.9	8.7	45.6	14.3		53.3	47.5	35.5	48.4	41.2	
Progression Factor	1.00	1.00	1.00	1.12	0.72		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.6	0.0	4.2	0.6		29.9	0.2	0.1	0.5	0.0	
Delay (s)	51.2	16.5	8.7	55.3	10.9		83.3	47.7	35.6	49.0	41.3	
Level of Service	D	B	A	E	B		F	D	D	D	D	
Approach Delay (s)		17.4			17.1			46.1			46.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.2	
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2150	360	0	1200	500	0	0	1200	0	0	190
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2337	391	0	1304	543	0	0	1304	0	0	207
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.93			0.83			0.87	0.87	0.83	0.87	0.87	0.93
vC, conflicting volume	1848			2728			3196	4185	1168	3777	4033	652
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1755			2673			2839	3980	794	3510	3804	463
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	59
cM capacity (veh/h)	326			127			4	3	275	0	3	505

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	1168	1168	391	652	652	543	1304	103	103
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	391	0	0	543	1304	103	103
cSH	1700	1700	1700	1700	1700	1700	275	505	505
Volume to Capacity	0.69	0.69	0.23	0.38	0.38	0.32	4.74	0.20	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	Err	19	19
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	Err	14.0	14.0
Lane LOS							F	B	B
Approach Delay (s)	0.0			0.0			Err	14.0	
Approach LOS							F	B	

Intersection Summary				
Average Delay	2143.1			
Intersection Capacity Utilization	140.4%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1980	220	0	800	260	900	0	900	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2152	239	0	870	283	978	0	978	0	0	0
RTOR Reduction (vph)	0	0	119	0	0	141	0	0	3	0	0	0
Lane Group Flow (vph)	0	2152	120	0	870	142	489	489	975	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		55.1	55.1		55.1	55.1	44.1	44.1	44.1			
Effective Green, g (s)		55.1	55.1		55.1	55.1	44.1	44.1	44.1			
Actuated g/C Ratio		0.50	0.50		0.50	0.50	0.40	0.40	0.40			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2547	793		2547	793	674	674	1117			
v/s Ratio Prot		c0.42			0.17		0.29	0.29	c0.35			
v/s Ratio Perm			0.08			0.09						
v/c Ratio		0.84	0.15		0.34	0.18	0.73	0.73	0.87			
Uniform Delay, d1		23.8	14.8		16.5	15.0	27.8	27.8	30.4			
Progression Factor		0.86	0.50		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		3.6	0.4		0.4	0.5	3.9	3.9	7.7			
Delay (s)		24.0	7.8		16.9	15.5	31.7	31.7	38.1			
Level of Service		C	A		B	B	C	C	D			
Approach Delay (s)		22.4			16.6			34.9			0.0	
Approach LOS		C			B			C			A	

Intersection Summary				
HCM Average Control Delay	25.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	78.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	1650	1100	160	690	20	150	110	150	40	100	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	1793	1196	174	750	22	163	120	163	43	109	239
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	78	0	0	110
Lane Group Flow (vph)	326	1793	1196	174	750	9	163	120	85	43	109	129
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	18.0	70.7	135.0	20.1	72.7	17.4	10.6	17.4	70.7	7.6	14.6	72.7
Effective Green, g (s)	18.0	70.7	135.0	20.1	72.7	17.4	10.6	17.4	70.7	7.6	14.6	72.7
Actuated g/C Ratio	0.13	0.52	1.00	0.15	0.54	0.13	0.08	0.13	0.52	0.06	0.11	0.54
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	458	2663	1583	264	2738	204	270	240	829	100	201	852
v/s Ratio Prot	0.09	0.35		0.10	0.15		0.05	0.06		0.02	0.06	
v/s Ratio Perm			c0.76			0.01			0.05			0.08
v/c Ratio	0.71	0.67	0.76	0.66	0.27	0.04	0.60	0.50	0.10	0.43	0.54	0.15
Uniform Delay, d1	56.0	23.7	0.0	54.2	16.9	51.5	60.2	54.7	16.2	61.6	57.0	15.6
Progression Factor	1.00	1.00	1.00	1.06	1.44	0.73	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	1.4	3.4	5.7	0.2	0.1	3.8	1.6	0.2	3.0	3.0	0.4
Delay (s)	61.2	25.0	3.4	63.2	24.5	37.8	63.9	56.4	16.4	64.6	60.0	16.0
Level of Service	E	C	A	E	C	D	E	E	B	E	E	B
Approach Delay (s)		20.8			31.9			44.5			33.6	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	25.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	64.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard &

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1400	110	70	740	110	55	10	100	55	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5030		1770	4986			1787	1583		1787	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.65	1.00
Satd. Flow (perm)	1770	5030		1770	4986			1212	1583		1212	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1522	120	76	804	120	60	11	109	60	11	43
RTOR Reduction (vph)	0	4	0	0	9	0	0	0	99	0	0	39
Lane Group Flow (vph)	261	1638	0	76	915	0	0	71	10	0	71	4
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	25.6	100.8		9.8	85.0			12.4	12.4		12.4	12.4
Effective Green, g (s)	25.6	100.8		9.8	85.0			12.4	12.4		12.4	12.4
Actuated g/C Ratio	0.19	0.75		0.07	0.63			0.09	0.09		0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	336	3756		128	3139			111	145		111	145
v/s Ratio Prot	c0.15	c0.33		0.04	0.18							
v/s Ratio Perm								c0.06	0.01		0.06	0.00
v/c Ratio	0.78	0.44		0.59	0.29			0.64	0.07		0.64	0.03
Uniform Delay, d1	52.0	6.4		60.7	11.3			59.1	56.0		59.1	55.8
Progression Factor	1.08	0.71		0.62	1.55			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.6	0.3		6.5	0.2			11.5	0.2		11.5	0.1
Delay (s)	64.7	4.9		44.0	17.8			70.6	56.2		70.6	55.9
Level of Service	E	A		D	B			E	E		E	E
Approach Delay (s)		13.1			19.8			61.9			65.1	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	900	320	190	660	80	170	180	100	40	30	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4885		3433	5085	1583	1770	3349		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4885		3433	5085	1583	1770	3349		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	348	978	348	207	717	87	185	196	109	43	33	76
RTOR Reduction (vph)	0	48	0	0	0	52	0	54	0	0	0	54
Lane Group Flow (vph)	348	1278	0	207	717	35	185	251	0	43	33	22
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	18.3	49.1		11.9	42.6	42.6	17.1	51.5		3.8	38.2	38.2
Effective Green, g (s)	18.3	49.1		11.9	42.6	42.6	17.1	51.5		3.8	38.2	38.2
Actuated g/C Ratio	0.14	0.36		0.09	0.32	0.32	0.13	0.38		0.03	0.28	0.28
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	465	1777		303	1605	500	224	1278		50	527	448
v/s Ratio Prot	c0.10	c0.26		0.06	0.14		c0.10	c0.07		0.02	0.02	
v/s Ratio Perm						0.02						0.01
v/c Ratio	0.75	0.72		0.68	0.45	0.07	0.83	0.20		0.86	0.06	0.05
Uniform Delay, d1	56.1	37.0		59.7	36.8	32.3	57.5	27.9		65.3	35.3	35.2
Progression Factor	1.05	1.26		1.11	1.07	1.86	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	2.4		5.0	0.7	0.2	21.3	0.1		76.1	0.2	0.2
Delay (s)	64.8	49.0		71.1	39.9	60.3	78.8	28.0		141.4	35.6	35.4
Level of Service	E	D		E	D	E	E	C		F	D	D
Approach Delay (s)		52.3			48.1			47.2			65.4	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM Average Control Delay	50.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	500	250	500	700	380	100	300	180	200	450	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4831		3433	4817		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4831		3433	4817		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	543	272	543	761	413	109	326	196	217	489	163
RTOR Reduction (vph)	0	64	0	0	70	0	0	0	145	0	0	91
Lane Group Flow (vph)	435	751	0	543	1104	0	109	326	51	217	489	72
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	21.6	41.3		26.1	45.9		8.3	34.9	34.9	13.1	39.9	39.9
Effective Green, g (s)	21.6	41.3		26.1	45.9		8.3	34.9	34.9	13.1	39.9	39.9
Actuated g/C Ratio	0.16	0.31		0.19	0.34		0.06	0.26	0.26	0.10	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	549	1478		664	1638		211	915	409	333	1046	468
v/s Ratio Prot	0.13	0.16		c0.16	c0.23		0.03	0.09		c0.06	c0.14	
v/s Ratio Perm									0.03			0.05
v/c Ratio	0.79	0.51		0.82	0.67		0.52	0.36	0.12	0.65	0.47	0.15
Uniform Delay, d1	54.5	38.5		52.2	38.1		61.4	40.9	38.3	58.8	38.9	35.1
Progression Factor	1.11	1.27		0.96	0.85		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	1.0		7.3	2.1		2.1	1.1	0.6	4.5	1.5	0.7
Delay (s)	66.7	49.8		57.3	34.5		63.5	42.0	39.0	63.3	40.4	35.8
Level of Service	E	D		E	C		E	D	D	E	D	D
Approach Delay (s)		55.7			41.7			44.8			45.2	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	46.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	65.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Clairemont Mesa Boulevard & Murphy Canyon Road

2035 AM
9/24/2012

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	730	150	470	1610	200	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	793	163	511	1750	217	98
RTOR Reduction (vph)	0	0	33	0	0	0	12
Lane Group Flow (vph)	0	793	130	511	1750	217	86
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		53.7	53.7	44.1	102.8	21.8	65.9
Effective Green, g (s)		53.7	53.7	44.1	102.8	21.8	65.9
Actuated g/C Ratio		0.40	0.40	0.33	0.76	0.16	0.49
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1408	630	578	3872	286	773
v/s Ratio Prot		c0.22		c0.29	0.34	c0.12	0.04
v/s Ratio Perm			0.08				0.02
v/c Ratio		0.56	0.21	0.88	0.45	0.76	0.11
Uniform Delay, d1		31.5	26.7	43.0	5.9	54.1	18.7
Progression Factor		1.60	1.97	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6	0.7	14.9	0.4	11.0	0.1
Delay (s)		52.2	53.2	58.0	6.2	65.1	18.8
Level of Service		D	D	E	A	E	B
Approach Delay (s)		52.3			17.9	50.7	
Approach LOS		D			B	D	

Intersection Summary				
HCM Average Control Delay	30.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.4	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — 2035 AM
10: Clairemont Mesa Boulevard & I-15 SB Off-Ramp — 9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	510	310	530	1270	0	0	0	0	110	10	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1452	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1452	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	554	337	576	1380	0	0	0	0	120	11	880
RTOR Reduction (vph)	0	0	213	0	0	0	0	0	0	0	18	18
Lane Group Flow (vph)	0	554	124	576	1380	0	0	0	0	108	436	431
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		30.7	36.9	20.4	55.1					36.9	36.9	36.9
Effective Green, g (s)		30.7	36.9	20.4	55.1					36.9	36.9	36.9
Actuated g/C Ratio		0.31	0.37	0.20	0.55					0.37	0.37	0.37
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1086	1028	700	1950					620	536	555
v/s Ratio Prot		0.16		c0.17	c0.39					0.06	c0.30	
v/s Ratio Perm			0.04									0.29
v/c Ratio		0.51	0.12	0.82	0.71					0.17	0.81	0.78
Uniform Delay, d1		28.5	20.8	38.1	16.5					21.3	28.5	27.9
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	7.8	2.2					0.1	9.2	6.8
Delay (s)		28.9	20.9	45.8	18.7					21.4	37.7	34.7
Level of Service		C	C	D	B					C	D	C
Approach Delay (s)		25.9			26.7			0.0			34.6	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	28.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	105.8%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — 2035 AM
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp — 9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	390	0	0	800	310	1020	0	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3391		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3391		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	424	0	0	870	337	1109	0	196	0	0	0
RTOR Reduction (vph)	0	0	0	0	51	0	0	0	128	0	0	0
Lane Group Flow (vph)	250	424	0	0	1156	0	1109	0	68	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	7.5	42.3			30.6		27.7		27.7			
Effective Green, g (s)	7.5	42.3			30.6		27.7		27.7			
Actuated g/C Ratio	0.09	0.53			0.38		0.35		0.35			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	322	1871			1297		1189		548			
v/s Ratio Prot	c0.07	0.12			c0.34		c0.32					
v/s Ratio Perm									0.04			
v/c Ratio	0.78	0.23			0.89		0.93		0.12			
Uniform Delay, d1	35.4	10.1			23.1		25.3		17.9			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	11.1	0.3			9.5		13.0		0.1			
Delay (s)	46.6	10.4			32.7		38.3		18.0			
Level of Service	D	B			C		D		B			
Approach Delay (s)		23.8			32.7			35.2			0.0	
Approach LOS		C			C			D			A	

Intersection Summary				
HCM Average Control Delay	31.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2	
Intersection Capacity Utilization	105.8%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
12: Lightwave Avenue & Overland Avenue

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	150	80	120	220	250	80	150	50	170	350	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3354		1770	3257		1770	3407		1770	3404	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3354		1770	3257		1770	3407		1770	3404	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	163	87	130	239	272	87	163	54	185	380	130
RTOR Reduction (vph)	0	69	0	0	211	0	0	35	0	0	35	0
Lane Group Flow (vph)	130	181	0	130	300	0	87	182	0	185	475	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.8	13.5		9.1	14.8		6.4	13.1		11.4	18.1	
Effective Green, g (s)	7.8	13.5		9.1	14.8		6.4	13.1		11.4	18.1	
Actuated g/C Ratio	0.12	0.21		0.14	0.23		0.10	0.20		0.17	0.28	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	210	689		245	734		172	679		307	938	
v/s Ratio Prot	c0.07	0.05		0.07	c0.09		0.05	0.05		c0.10	c0.14	
v/s Ratio Perm												
v/c Ratio	0.62	0.26		0.53	0.41		0.51	0.27		0.60	0.51	
Uniform Delay, d1	27.5	21.9		26.3	21.7		28.1	22.2		25.1	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.8	0.2		1.1	0.4		0.9	0.2		2.3	0.5	
Delay (s)	31.3	22.1		27.4	22.1		29.0	22.5		27.3	20.5	
Level of Service	C	C		C	C		C	C		C	C	
Approach Delay (s)		25.3			23.2			24.3			22.3	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	23.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

2035 AM
9/24/2012

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	330	380	140	620	600	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3530	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3530	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	413	152	674	652	11
RTOR Reduction (vph)	0	216	0	0	1	0
Lane Group Flow (vph)	359	197	152	674	662	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	21.3	21.3	11.5	47.4	31.7	
Effective Green, g (s)	21.3	21.3	11.5	47.4	31.7	
Actuated g/C Ratio	0.27	0.27	0.14	0.59	0.40	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	471	421	254	2097	1399	
v/s Ratio Prot	c0.20		c0.09	0.19	c0.19	
v/s Ratio Perm		0.12				
v/c Ratio	0.76	0.47	0.60	0.32	0.47	
Uniform Delay, d1	27.0	24.6	32.1	8.2	17.9	
Progression Factor	1.00	1.00	1.01	1.68	1.00	
Incremental Delay, d2	7.2	0.8	3.5	0.4	1.1	
Delay (s)	34.2	25.4	36.0	14.2	19.1	
Level of Service	C	C	D	B	B	
Approach Delay (s)	29.5			18.2	19.1	
Approach LOS	C			B	B	

Intersection Summary				
HCM Average Control Delay	22.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	55.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	0	550	0	0	0	0	750	60	60	920	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	0	598	0	0	0	0	815	65	65	1000	0
RTOR Reduction (vph)	0	0	133	0	0	0	0	0	33	0	0	0
Lane Group Flow (vph)	0	130	465	0	0	0	0	815	32	65	1000	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		19.1	19.1					38.9	38.9	6.5	49.6	
Effective Green, g (s)		19.1	19.1					38.9	38.9	6.5	49.6	
Actuated g/C Ratio		0.24	0.24					0.49	0.49	0.08	0.62	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		423	665					1721	770	144	2194	
v/s Ratio Prot								0.23		0.04	c0.28	
v/s Ratio Perm		0.07	c0.17						0.02			
v/c Ratio		0.31	0.70					0.47	0.04	0.45	0.46	
Uniform Delay, d1		25.0	27.8					13.7	10.8	35.0	8.1	
Progression Factor		1.00	1.00					1.00	1.00	1.05	0.81	
Incremental Delay, d2		0.4	3.2					0.9	0.1	2.0	0.6	
Delay (s)		25.4	31.0					14.7	10.9	38.9	7.1	
Level of Service		C	C					B	B	D	A	
Approach Delay (s)		30.0			0.0			14.4			9.0	
Approach LOS		C			A			B			A	

Intersection Summary				
HCM Average Control Delay	16.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.3	
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	80	60	10	10	10	20	650	60	100	1090	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1742	1583	1770	1723		1770	3495		3433	3431	
Flt Permitted	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1742	1583	1770	1723		1770	3495		3433	3431	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	87	65	11	11	11	22	707	65	109	1185	304
RTOR Reduction (vph)	0	0	54	0	11	0	0	8	0	0	26	0
Lane Group Flow (vph)	122	128	11	11	11	0	22	764	0	109	1463	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.6	10.6	10.6	1.2	1.2		1.2	30.9		4.6	34.3	
Effective Green, g (s)	10.6	10.6	10.6	1.2	1.2		1.2	30.9		4.6	34.3	
Actuated g/C Ratio	0.17	0.17	0.17	0.02	0.02		0.02	0.49		0.07	0.54	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	292	265	34	33		34	1706		249	1859	
v/s Ratio Prot	0.07	c0.07		0.01	c0.01		0.01	0.22		c0.03	c0.43	
v/s Ratio Perm			0.01									
v/c Ratio	0.43	0.44	0.04	0.32	0.34		0.65	0.45		0.44	0.79	
Uniform Delay, d1	23.7	23.7	22.1	30.6	30.7		30.8	10.6		28.1	11.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.1	0.1	5.5	6.0		35.3	0.2		1.2	2.3	
Delay (s)	24.7	24.7	22.2	36.1	36.7		66.1	10.8		29.3	13.9	
Level of Service	C	C	C	D	D		E	B		C	B	
Approach Delay (s)		24.2			36.5			12.3			14.9	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	80	40	30	70	120	120	550	50	190	800	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1583		1835	1583	1770	3495		1770	3465	
Flt Permitted		0.90	1.00		0.86	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1678	1583		1606	1583	1770	3495		1770	3465	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	87	43	33	76	130	130	598	54	207	870	141
RTOR Reduction (vph)	0	0	37	0	0	110	0	6	0	0	12	0
Lane Group Flow (vph)	0	109	6	0	109	20	130	646	0	207	999	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		8.7	8.7		9.3	9.3	7.1	24.9		11.7	29.5	
Effective Green, g (s)		8.7	8.7		9.3	9.3	7.1	24.9		11.7	29.5	
Actuated g/C Ratio		0.14	0.14		0.15	0.15	0.12	0.41		0.19	0.49	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		241	228		247	243	208	1438		342	1690	
v/s Ratio Prot							0.07	0.18		c0.12	c0.29	
v/s Ratio Perm		0.06	0.00		c0.07	0.01						
v/c Ratio		0.45	0.03		0.44	0.08	0.62	0.45		0.61	0.59	
Uniform Delay, d1		23.7	22.3		23.2	21.9	25.4	12.8		22.3	11.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		0.5	0.1	4.2	0.4		2.1	0.7	
Delay (s)		24.2	22.3		23.7	22.0	29.6	13.2		24.4	11.9	
Level of Service		C	C		C	C	C	B		C	B	
Approach Delay (s)		23.7			22.8			15.9			14.0	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	16.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	30	10	0	0	50	700	10	10	800	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3532		1770	3491	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3532		1770	3491	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	33	11	0	0	54	761	11	11	870	87
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	33	2	0	0	11	0	54	772	0	11	952	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.4	3.4			0.8		2.6	38.1		0.5	36.0	
Effective Green, g (s)	3.4	3.4			0.8		2.6	38.1		0.5	36.0	
Actuated g/C Ratio	0.05	0.05			0.01		0.04	0.61		0.01	0.58	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	97	86			23		143	2160		14	2017	
v/s Ratio Prot	c0.02	0.00			c0.01		c0.02	0.22		0.01	c0.27	
v/s Ratio Perm												
v/c Ratio	0.34	0.02			0.48		0.38	0.36		0.79	0.47	
Uniform Delay, d1	28.4	27.9			30.5		29.1	6.0		30.8	7.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.0			5.6		0.6	0.3		123.8	0.5	
Delay (s)	29.1	27.9			36.1		29.7	6.3		154.7	8.1	
Level of Service	C	C			D		C	A		F	A	
Approach Delay (s)		28.5			36.1			7.8			9.8	
Approach LOS		C			D			A			A	

Intersection Summary				
HCM Average Control Delay	9.7	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	40.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	15	25	30	20	10	220	770	90	40	670	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1802	1583		1808	1583	3433	3484		1770	3459	
Flt Permitted		0.86	1.00		0.82	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1599	1583		1528	1583	3433	3484		1770	3459	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	16	27	33	22	11	239	837	98	43	728	130
RTOR Reduction (vph)	0	0	25	0	0	10	0	7	0	0	14	0
Lane Group Flow (vph)	0	49	2	0	55	1	239	928	0	43	844	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		3.9	3.9		3.9	3.9	6.7	29.0		1.4	23.7	
Effective Green, g (s)		3.9	3.9		3.9	3.9	6.7	29.0		1.4	23.7	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.14	0.59		0.03	0.48	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		128	126		122	126	470	2066		51	1676	
v/s Ratio Prot							c0.07	0.27		0.02	c0.24	
v/s Ratio Perm		0.03	0.00		c0.04	0.00						
v/c Ratio		0.38	0.02		0.45	0.01	0.51	0.45		0.84	0.50	
Uniform Delay, d1		21.4	20.7		21.5	20.7	19.6	5.5		23.6	8.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0		1.0	0.0	0.3	0.4		68.5	0.6	
Delay (s)		22.1	20.8		22.4	20.7	19.9	5.9		92.2	9.2	
Level of Service		C	C		C	C	B	A		F	A	
Approach Delay (s)		21.6			22.2			8.8			13.2	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	50.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
20: Lightwave Avenue & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	80	140	50	100	100	320	380	90	230	620	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1723		3433	3437		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1723		3433	3437		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	87	152	54	109	109	348	413	98	250	674	359
RTOR Reduction (vph)	0	0	76	0	37	0	0	18	0	0	0	219
Lane Group Flow (vph)	109	87	76	54	181	0	348	493	0	250	674	140
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	8.1	18.8	31.9	4.3	15.6		13.1	18.4		16.2	21.5	29.6
Effective Green, g (s)	8.1	18.8	31.9	4.3	15.6		13.1	18.4		16.2	21.5	29.6
Actuated g/C Ratio	0.11	0.25	0.42	0.06	0.21		0.17	0.24		0.21	0.28	0.39
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	367	462	666	100	355		593	834		378	1004	618
v/s Ratio Prot	0.03	c0.05	0.02	c0.03	c0.10		0.10	0.14		c0.14	c0.19	0.02
v/s Ratio Perm			0.03									0.06
v/c Ratio	0.30	0.19	0.11	0.54	0.51		0.59	0.59		0.66	0.67	0.23
Uniform Delay, d1	31.2	22.5	13.3	34.8	26.7		28.9	25.4		27.3	24.0	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.1	5.8	1.2		1.5	1.1		4.3	1.8	0.2
Delay (s)	31.7	22.7	13.4	40.6	27.9		30.3	26.5		31.6	25.8	15.6
Level of Service	C	C	B	D	C		C	C		C	C	B
Approach Delay (s)		21.5			30.4			28.1			24.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	22.1	
Intersection Capacity Utilization	55.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	10	160	10	0	10	550	770	50	15	700	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3507		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3507		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	11	174	11	0	11	598	837	54	16	761	196
RTOR Reduction (vph)	0	0	116	0	0	11	0	3	0	0	0	79
Lane Group Flow (vph)	87	11	58	0	11	0	598	888	0	16	761	117
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	5.6	5.6	24.3		2.2	2.2	18.7	43.9		0.6	25.8	25.8
Effective Green, g (s)	5.6	5.6	24.3		2.2	2.2	18.7	43.9		0.6	25.8	25.8
Actuated g/C Ratio	0.08	0.08	0.34		0.03	0.03	0.26	0.61		0.01	0.36	0.36
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	266	144	531		54	48	887	2126		15	1261	564
v/s Ratio Prot	c0.03	0.01	0.03		c0.01		c0.17	0.25		0.01	c0.22	
v/s Ratio Perm			0.01			0.00						0.07
v/c Ratio	0.33	0.08	0.11		0.20	0.01	0.67	0.42		1.07	0.60	0.21
Uniform Delay, d1	31.6	31.0	16.6		34.2	34.0	24.1	7.5		35.9	19.1	16.2
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.1		1.9	0.1	2.0	0.1		255.5	0.8	0.2
Delay (s)	32.3	31.2	16.7		36.1	34.1	26.2	7.6		291.4	19.9	16.4
Level of Service	C	C	B		D	C	C	A		F	B	B
Approach Delay (s)		22.3			35.1			15.1			23.7	
Approach LOS		C			D			B			C	

Intersection Summary				
HCM Average Control Delay	19.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	56.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

2035 AM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	310	490	640	1070	720	120	500	70	150	500	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4618		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4618		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	337	533	696	1163	783	130	543	76	163	543	152
RTOR Reduction (vph)	0	90	0	0	0	142	0	0	58	0	0	88
Lane Group Flow (vph)	293	780	0	696	1163	641	130	543	18	163	543	64
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	26.1	29.9		44.1	48.1	53.5	8.8	30.2	30.2	5.4	26.9	26.9
Effective Green, g (s)	26.1	29.9		44.1	48.1	53.5	8.8	30.2	30.2	5.4	26.9	26.9
Actuated g/C Ratio	0.20	0.23		0.34	0.37	0.41	0.07	0.23	0.23	0.04	0.21	0.21
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	355	1061		600	1880	1146	232	822	367	142	732	327
v/s Ratio Prot	0.17	c0.17		c0.39	0.23	0.02	0.04	c0.15		c0.05	c0.15	
v/s Ratio Perm						0.21			0.01			0.04
v/c Ratio	0.83	1.18dr		1.16	0.62	0.56	0.56	0.66	0.05	1.15	0.74	0.20
Uniform Delay, d1	49.8	46.4		43.0	33.5	29.3	58.8	45.3	38.8	62.3	48.3	42.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.4	2.7		89.5	0.6	0.6	3.1	2.0	0.1	120.8	4.1	0.3
Delay (s)	64.2	49.1		132.5	34.1	29.9	61.9	47.3	38.8	183.1	52.4	43.0
Level of Service	E	D		F	C	C	E	D	D	F	D	D
Approach Delay (s)		52.9			58.8			49.0			75.6	
Approach LOS		D			E			D			E	

Intersection Summary				
HCM Average Control Delay	58.8	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	130.1	Sum of lost time (s)	25.8	
Intersection Capacity Utilization	87.7%	ICU Level of Service	E	
Analysis Period (min)	15			
dr Defacto Right Lane. Recode with 1 though lane as a right lane.				
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	320	60	750	2320	600	10	40	80	100	80	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4965		1770	6210			1844	1583	1770	1707	
Flt Permitted	0.95	1.00		0.95	1.00			0.80	1.00	0.72	1.00	
Satd. Flow (perm)	1770	4965		1770	6210			1483	1583	1345	1707	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	348	65	815	2522	652	11	43	87	109	87	109
RTOR Reduction (vph)	0	16	0	0	25	0	0	0	75	0	35	0
Lane Group Flow (vph)	163	397	0	815	3149	0	0	54	12	109	161	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	15.1	29.6		62.7	78.2			17.4	17.4	17.4	17.4	
Effective Green, g (s)	15.1	29.6		62.7	78.2			17.4	17.4	17.4	17.4	
Actuated g/C Ratio	0.12	0.23		0.50	0.62			0.14	0.14	0.14	0.14	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	212	1165		880	3851			205	218	186	236	
v/s Ratio Prot	0.09	0.08		c0.46	c0.51						c0.09	
v/s Ratio Perm								0.04	0.01	0.08		
v/c Ratio	0.77	0.34		0.93	0.82			0.26	0.06	0.59	0.68	
Uniform Delay, d1	53.8	40.1		29.5	18.5			48.6	47.2	51.0	51.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.4	0.2		15.3	1.4			0.7	0.1	4.7	7.8	
Delay (s)	69.2	40.3		44.9	19.9			49.3	47.3	55.6	59.5	
Level of Service	E	D		D	B			D	D	E	E	
Approach Delay (s)		48.5			25.0			48.1			58.1	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	126.1	Sum of lost time (s)	9.3
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1750	60	250	1200	150	40	10	550	230	20	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5001		1770	1514	1504	3433	3162	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5001		1770	1514	1504	3433	3162	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1902	65	272	1304	163	43	11	598	250	22	54
RTOR Reduction (vph)	0	0	19	0	10	0	0	137	10	0	43	0
Lane Group Flow (vph)	54	1902	46	272	1457	0	43	167	295	250	33	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.0	69.2	75.8	14.2	75.8		6.2	18.7	32.9	13.7	26.5	
Effective Green, g (s)	7.0	69.2	75.8	14.2	75.8		6.2	18.7	32.9	13.7	26.5	
Actuated g/C Ratio	0.05	0.51	0.56	0.11	0.56		0.05	0.14	0.24	0.10	0.20	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	92	2607	889	361	2808		81	210	367	348	621	
v/s Ratio Prot	0.03	c0.37		0.08	0.29		0.02	0.11	c0.08	c0.07	0.01	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	0.59	0.73	0.05	0.75	0.52		0.53	0.80	0.80	0.72	0.05	
Uniform Delay, d1	62.6	25.6	13.4	58.7	18.3		63.0	56.3	48.0	58.8	44.1	
Progression Factor	1.00	1.00	1.00	1.02	0.97		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.0	1.8	0.0	7.2	0.2		3.3	17.4	11.4	5.8	0.0	
Delay (s)	68.6	27.5	13.4	67.0	17.9		66.3	73.7	59.4	64.6	44.1	
Level of Service	E	C	B	E	B		E	E	E	E	D	
Approach Delay (s)		28.1			25.6			66.5			59.8	
Approach LOS		C			C			E			E	

Intersection Summary				
HCM Average Control Delay	34.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1590	940	0	1110	1100	0	0	500	0	0	60
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1728	1022	0	1207	1196	0	0	543	0	0	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.86			0.71			0.78	0.78	0.71	0.78	0.78	0.86
vC, conflicting volume	2402			2750			2397	4130	864	2614	3957	603
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2303			2648			1408	3627	0	1686	3405	206
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	29	100	100	91
cM capacity (veh/h)	184			111			70	4	770	14	6	687

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	864	864	1022	603	603	1196	543	33	33
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1022	0	0	1196	543	33	33
cSH	1700	1700	1700	1700	1700	1700	770	687	687
Volume to Capacity	0.51	0.51	0.60	0.35	0.35	0.70	0.71	0.05	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	149	4	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	20.1	10.5	10.5
Lane LOS							C	B	B
Approach Delay (s)	0.0			0.0			20.1	10.5	
Approach LOS							C	B	

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1210	880	0	1980	800	230	0	500	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1315	957	0	2152	870	250	0	543	0	0	0
RTOR Reduction (vph)	0	0	271	0	0	246	0	0	113	0	0	0
Lane Group Flow (vph)	0	1315	686	0	2152	624	125	125	430	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		96.8	96.8		96.8	96.8	27.4	27.4	27.4			
Effective Green, g (s)		96.8	96.8		96.8	96.8	27.4	27.4	27.4			
Actuated g/C Ratio		0.72	0.72		0.72	0.72	0.20	0.20	0.20			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3646	1135		3646	1135	341	341	566			
v/s Ratio Prot		0.26			0.42		0.07	0.07	c0.15			
v/s Ratio Perm			c0.43			0.39						
v/c Ratio		0.36	0.60		0.59	0.55	0.37	0.37	0.76			
Uniform Delay, d1		7.3	9.5		9.4	8.9	46.3	46.3	50.7			
Progression Factor		0.74	1.48		0.25	5.67	1.00	1.00	1.00			
Incremental Delay, d2		0.2	2.0		0.4	1.0	0.7	0.7	5.8			
Delay (s)		5.6	16.1		2.7	51.7	47.0	47.0	56.5			
Level of Service		A	B		A	D	D	D	E			
Approach Delay (s)		10.0			16.8			53.5			0.0	
Approach LOS		B			B			D			A	

Intersection Summary				
HCM Average Control Delay	19.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	64.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	960	450	200	1800	50	550	150	300	60	115	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	1043	489	217	1957	54	598	163	326	65	125	467
RTOR Reduction (vph)	0	0	0	0	0	10	0	0	202	0	0	276
Lane Group Flow (vph)	326	1043	489	217	1957	44	598	163	124	65	125	191
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	17.3	51.3	135.0	21.3	55.2	34.1	28.1	34.1	51.3	9.1	15.3	55.2
Effective Green, g (s)	17.3	51.3	135.0	21.3	55.2	34.1	28.1	34.1	51.3	9.1	15.3	55.2
Actuated g/C Ratio	0.13	0.38	1.00	0.16	0.41	0.25	0.21	0.25	0.38	0.07	0.11	0.41
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	440	1932	1583	279	2079	400	715	471	602	119	211	647
v/s Ratio Prot	0.09	0.21		c0.12	c0.38		c0.17	0.09		0.04	c0.07	
v/s Ratio Perm			0.31			0.03			0.08			0.12
v/c Ratio	0.74	0.54	0.31	0.78	0.94	0.11	0.84	0.35	0.21	0.55	0.59	0.30
Uniform Delay, d1	56.7	32.6	0.0	54.6	38.3	38.8	51.2	41.3	28.1	61.0	56.9	26.8
Progression Factor	1.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	1.0	0.5	12.8	10.1	0.1	8.4	0.4	0.8	5.0	4.4	1.2
Delay (s)	68.1	33.6	0.5	67.4	48.4	38.9	59.7	41.8	28.9	66.0	61.3	28.0
Level of Service	E	C	A	E	D	D	E	D	C	E	E	C
Approach Delay (s)		30.9			50.0			47.8			38.1	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	42.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	89.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1200	50	110	1600	50	100	10	70	90	10	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5055		1770	5062			1782	1583		1783	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.62	1.00		0.59	1.00
Satd. Flow (perm)	1770	5055		1770	5062			1149	1583		1092	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1304	54	120	1739	54	109	11	76	98	11	98
RTOR Reduction (vph)	0	4	0	0	3	0	0	0	64	0	0	83
Lane Group Flow (vph)	120	1354	0	120	1790	0	0	120	12	0	109	15
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.0	56.6		11.0	56.6			14.4	14.4		14.4	14.4
Effective Green, g (s)	11.0	56.6		11.0	56.6			14.4	14.4		14.4	14.4
Actuated g/C Ratio	0.12	0.60		0.12	0.60			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	207	3044		207	3048			176	243		167	243
v/s Ratio Prot	c0.07	0.27		0.07	c0.35							
v/s Ratio Perm								c0.10	0.01		0.10	0.01
v/c Ratio	0.58	0.44		0.58	0.59			0.68	0.05		0.65	0.06
Uniform Delay, d1	39.3	10.2		39.3	11.5			37.6	34.0		37.4	34.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	0.5		3.9	0.8			10.4	0.1		8.8	0.1
Delay (s)	43.2	10.6		43.2	12.3			48.0	34.0		46.3	34.1
Level of Service	D	B		D	B			D	C		D	C
Approach Delay (s)		13.3			14.3			42.6			40.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	16.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1100	200	250	900	50	280	100	170	100	180	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4968		3433	5085	1583	1770	3205		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4968		3433	5085	1583	1770	3205		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1196	217	272	978	54	304	109	185	109	196	348
RTOR Reduction (vph)	0	19	0	0	0	24	0	120	0	0	0	150
Lane Group Flow (vph)	163	1394	0	272	978	30	304	174	0	109	196	198
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	10.6	45.0		12.6	46.9	46.9	22.7	47.4		11.3	36.0	36.0
Effective Green, g (s)	10.6	45.0		12.6	46.9	46.9	22.7	47.4		11.3	36.0	36.0
Actuated g/C Ratio	0.08	0.33		0.09	0.35	0.35	0.17	0.35		0.08	0.27	0.27
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	270	1656		320	1767	550	298	1125		148	497	422
v/s Ratio Prot	0.05	c0.28		c0.08	0.19		c0.17	0.05		0.06	0.11	
v/s Ratio Perm						0.02						c0.12
v/c Ratio	0.60	0.84		0.85	0.55	0.05	1.02	0.15		0.74	0.39	0.47
Uniform Delay, d1	60.2	41.7		60.3	35.6	29.3	56.1	30.1		60.4	40.6	41.5
Progression Factor	1.00	1.00		1.09	1.05	1.50	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	5.4		16.3	1.1	0.2	57.4	0.1		17.3	2.3	3.7
Delay (s)	63.9	47.1		82.2	38.5	44.2	113.5	30.1		77.7	42.9	45.2
Level of Service	E	D		F	D	D	F	C		E	D	D
Approach Delay (s)		48.8			47.9			72.5			49.9	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	52.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.7	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	900	280	250	550	150	250	770	210	600	500	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4904		3433	4922		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4904		3433	4922		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	380	978	304	272	598	163	272	837	228	652	543	348
RTOR Reduction (vph)	0	41	0	0	36	0	0	0	118	0	0	171
Lane Group Flow (vph)	380	1241	0	272	725	0	272	837	110	652	543	177
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	18.9	38.8		12.6	32.6		15.2	36.1	36.1	27.9	49.0	49.0
Effective Green, g (s)	18.9	38.8		12.6	32.6		15.2	36.1	36.1	27.9	49.0	49.0
Actuated g/C Ratio	0.14	0.29		0.09	0.24		0.11	0.27	0.27	0.21	0.36	0.36
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	481	1409		320	1189		387	946	423	709	1285	575
v/s Ratio Prot	c0.11	c0.25		0.08	0.15		0.08	c0.24		c0.19	0.15	
v/s Ratio Perm									0.07			0.11
v/c Ratio	0.79	0.88		0.85	0.61		0.70	0.88	0.26	0.92	0.42	0.31
Uniform Delay, d1	56.1	45.9		60.3	45.5		57.7	47.5	38.9	52.5	32.4	30.8
Progression Factor	1.09	1.78		1.02	0.89		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	6.1		18.4	2.3		5.7	11.9	1.5	16.9	1.0	1.4
Delay (s)	67.8	87.7		79.8	43.0		63.4	59.3	40.4	69.4	33.4	32.2
Level of Service	E	F		E	D		E	E	D	E	C	C
Approach Delay (s)		83.1			52.7			56.9			48.3	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	61.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

2035 PM
9/24/2012

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1710	0	0	950	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2			5.1		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1859	0	0	1033	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1859	0	0	1033	0	0
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	119.9			120.0		
Effective Green, g (s)	119.9			120.0		
Actuated g/C Ratio	0.89			0.89		
Clearance Time (s)	5.2			5.1		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4516			4520		
v/s Ratio Prot	c0.37			0.20		
v/s Ratio Perm						
v/c Ratio	0.41			0.23		
Uniform Delay, d1	1.3			1.0		
Progression Factor	0.31			1.91		
Incremental Delay, d2	0.1			0.1		
Delay (s)	0.6			2.1		
Level of Service	A			A		
Approach Delay (s)	0.6			2.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	1.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Clairemont Mesa Boulevard & Murphy Canyon Road

2035 PM
9/24/2012

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1460	250	240	880	200	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1587	272	261	957	217	565
RTOR Reduction (vph)	0	0	22	0	0	0	0
Lane Group Flow (vph)	0	1587	250	261	957	217	565
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		67.8	67.8	29.2	102.0	22.6	51.8
Effective Green, g (s)		67.8	67.8	29.2	102.0	22.6	51.8
Actuated g/C Ratio		0.50	0.50	0.22	0.76	0.17	0.38
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1777	795	383	3842	296	607
v/s Ratio Prot		c0.45		0.15	0.19	0.12	c0.20
v/s Ratio Perm			0.16				0.16
v/c Ratio		0.89	0.31	0.68	0.25	0.73	0.93
Uniform Delay, d1		30.3	19.9	48.6	5.0	53.3	39.9
Progression Factor		1.90	2.07	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.9	1.0	4.9	0.2	9.0	21.1
Delay (s)		64.4	42.0	53.6	5.1	62.4	61.0
Level of Service		E	D	D	A	E	E
Approach Delay (s)		61.1			15.5	61.4	
Approach LOS		E			B	E	

Intersection Summary			
HCM Average Control Delay	46.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Clairemont Mesa Boulevard & I-15 SB Off-Ramp

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1260	720	240	840	0	0	0	0	880	10	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1606	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1606	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1370	783	261	913	0	0	0	0	957	11	304
RTOR Reduction (vph)	0	0	440	0	0	0	0	0	0	0	3	90
Lane Group Flow (vph)	0	1370	343	261	913	0	0	0	0	498	497	184
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		35.0	35.0	7.0	46.0					26.0	26.0	26.0
Effective Green, g (s)		35.0	35.0	7.0	46.0					26.0	26.0	26.0
Actuated g/C Ratio		0.44	0.44	0.09	0.58					0.32	0.32	0.32
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1548	1219	300	2035					546	522	489
v/s Ratio Prot		c0.39		c0.08	0.26					0.30	c0.31	
v/s Ratio Perm			0.12									0.12
v/c Ratio		0.89	0.28	0.87	0.45					0.91	0.95	0.38
Uniform Delay, d1		20.7	14.4	36.1	9.7					25.9	26.4	20.8
Progression Factor		1.00	1.00	1.32	1.11					1.00	1.00	1.00
Incremental Delay, d2		6.4	0.1	19.5	0.6					19.6	27.7	0.5
Delay (s)		27.1	14.6	66.9	11.4					45.5	54.1	21.2
Level of Service		C	B	E	B					D	D	C
Approach Delay (s)		22.5			23.7			0.0			43.7	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — 2035 PM
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp — 9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	590	1550	0	0	680	130	340	0	200	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3454		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3454		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	1685	0	0	739	141	370	0	217	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	33	0	0	0
Lane Group Flow (vph)	641	1685	0	0	862	0	370	0	184	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	19.3	56.6			33.1		13.4		13.4			
Effective Green, g (s)	19.3	56.6			33.1		13.4		13.4			
Actuated g/C Ratio	0.24	0.71			0.41		0.17		0.17			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	828	2504			1429		575		265			
v/s Ratio Prot	c0.19	c0.48			0.25		0.11					
v/s Ratio Perm									c0.12			
v/c Ratio	0.77	0.67			0.60		0.64		0.69			
Uniform Delay, d1	28.3	6.5			18.3		31.1		31.4			
Progression Factor	0.91	1.64			1.00		1.00		1.00			
Incremental Delay, d2	1.9	0.6			1.9		2.5		7.6			
Delay (s)	27.6	11.3			20.2		33.5		39.0			
Level of Service	C	B			C		C		D			
Approach Delay (s)		15.8			20.2			35.6			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — 2035 PM
12: Lightwave Avenue & Overland Avenue — 9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	200	100	80	220	230	100	200	130	320	220	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3362		1770	3268		1770	3330		1770	3352	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3362		1770	3268		1770	3330		1770	3352	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	217	109	87	239	250	109	217	141	348	239	130
RTOR Reduction (vph)	0	60	0	0	190	0	0	109	0	0	66	0
Lane Group Flow (vph)	152	266	0	87	299	0	109	249	0	348	303	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.9	18.1		6.9	14.1		7.7	12.7		21.0	26.0	
Effective Green, g (s)	10.9	18.1		6.9	14.1		7.7	12.7		21.0	26.0	
Actuated g/C Ratio	0.14	0.23		0.09	0.18		0.10	0.16		0.27	0.34	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	250	787		158	596		176	547		481	1127	
v/s Ratio Prot	c0.09	c0.08		0.05	c0.09		0.06	c0.07		c0.20	0.09	
v/s Ratio Perm												
v/c Ratio	0.61	0.34		0.55	0.50		0.62	0.46		0.72	0.27	
Uniform Delay, d1	31.2	24.6		33.7	28.4		33.4	29.2		25.5	18.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	0.3		2.3	0.7		4.5	0.7		4.5	0.1	
Delay (s)	34.0	24.9		36.1	29.2		37.9	29.8		30.1	18.9	
Level of Service	C	C		D	C		D	C		C	B	
Approach Delay (s)		27.8			30.2			31.7			24.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	23.5
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

2035 PM
9/24/2012

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	90	100	600	1150	900	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3522	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3522	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	109	652	1250	978	33
RTOR Reduction (vph)	0	99	0	0	2	0
Lane Group Flow (vph)	98	10	652	1250	1009	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	12.5	12.5	54.0	111.2	53.0	
Effective Green, g (s)	12.5	12.5	54.0	111.2	53.0	
Actuated g/C Ratio	0.09	0.09	0.40	0.82	0.39	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	164	147	708	2915	1383	
v/s Ratio Prot	c0.06		c0.37	0.35	c0.29	
v/s Ratio Perm		0.01				
v/c Ratio	0.60	0.07	0.92	0.43	0.73	
Uniform Delay, d1	58.8	55.9	38.5	3.2	34.9	
Progression Factor	1.00	1.00	1.05	2.80	1.00	
Incremental Delay, d2	5.7	0.2	5.4	0.1	3.4	
Delay (s)	64.6	56.1	45.9	9.2	38.3	
Level of Service	E	E	D	A	D	
Approach Delay (s)	60.1			21.8	38.3	
Approach LOS	E			C	D	

Intersection Summary			
HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	10	230	0	0	0	0	1580	500	460	540	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1779	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1779	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	11	250	0	0	0	0	1717	543	500	587	0
RTOR Reduction (vph)	0	0	220	0	0	0	0	0	176	0	0	0
Lane Group Flow (vph)	0	196	30	0	0	0	0	1717	367	500	587	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		16.0	16.0					65.7	65.7	37.8	107.7	
Effective Green, g (s)		16.0	16.0					65.7	65.7	37.8	107.7	
Actuated g/C Ratio		0.12	0.12					0.49	0.49	0.28	0.80	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		211	330					1722	770	496	2823	
v/s Ratio Prot								c0.49		c0.28	0.17	
v/s Ratio Perm		0.11	0.01						0.23			
v/c Ratio		0.93	0.09					1.00	0.48	1.01	0.21	
Uniform Delay, d1		58.9	53.0					34.6	23.2	48.6	3.3	
Progression Factor		1.00	1.00					1.00	1.00	1.57	0.16	
Incremental Delay, d2		42.0	0.1					21.0	2.1	36.0	0.1	
Delay (s)		101.0	53.1					55.6	25.3	112.1	0.7	
Level of Service		F	D					E	C	F	A	
Approach Delay (s)		74.1			0.0			48.3			51.9	
Approach LOS		E			A			D			D	

Intersection Summary			
HCM Average Control Delay	52.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	420	10	30	50	40	90	40	1550	10	20	620	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00		1.00	0.97	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1689	1583	1770	1669		1770	3536		3433	3447	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1689	1583	1770	1669		1770	3536		3433	3447	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	11	33	54	43	98	43	1685	11	22	674	141
RTOR Reduction (vph)	0	0	27	0	91	0	0	0	0	0	21	0
Lane Group Flow (vph)	233	235	6	54	50	0	43	1696	0	22	794	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.0	14.0	14.0	4.0	4.0		3.4	39.7		1.5	37.8	
Effective Green, g (s)	14.0	14.0	14.0	4.0	4.0		3.4	39.7		1.5	37.8	
Actuated g/C Ratio	0.19	0.19	0.19	0.05	0.05		0.05	0.53		0.02	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	313	314	295	94	89		80	1867		68	1733	
v/s Ratio Prot	0.14	c0.14		c0.03	0.03		c0.02	c0.48		0.01	0.23	
v/s Ratio Perm			0.00									
v/c Ratio	0.74	0.75	0.02	0.57	0.56		0.54	0.91		0.32	0.46	
Uniform Delay, d1	28.9	28.9	25.0	34.8	34.7		35.1	16.1		36.3	12.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	9.4	0.0	8.2	7.9		6.8	6.9		2.8	0.2	
Delay (s)	38.1	38.3	25.0	43.0	42.7		41.9	23.0		39.1	12.3	
Level of Service	D	D	C	D	D		D	C		D	B	
Approach Delay (s)		37.4			42.8			23.4			13.0	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM Average Control Delay	24.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	75.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	30	160	180	120	220	80	1300	40	70	680	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794	1583		1808	1583	1770	3524		1770	3496	
Flt Permitted		0.39	1.00		0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		717	1583		1370	1583	1770	3524		1770	3496	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	33	174	196	130	239	87	1413	43	76	739	65
RTOR Reduction (vph)	0	0	126	0	0	88	0	2	0	0	7	0
Lane Group Flow (vph)	0	142	48	0	326	151	87	1454	0	76	797	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		21.2	21.2		21.8	21.8	6.2	36.5		3.6	33.9	
Effective Green, g (s)		21.2	21.2		21.8	21.8	6.2	36.5		3.6	33.9	
Actuated g/C Ratio		0.28	0.28		0.28	0.28	0.08	0.48		0.05	0.44	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		199	439		390	451	143	1681		83	1549	
v/s Ratio Prot							c0.05	c0.41		0.04	0.23	
v/s Ratio Perm		0.20	0.03		c0.24	0.10						
v/c Ratio		0.71	0.11		0.84	0.33	0.61	0.86		0.92	0.51	
Uniform Delay, d1		24.9	20.6		25.7	21.6	34.0	17.8		36.3	15.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.6	0.0		13.8	0.2	4.9	5.2		69.6	0.4	
Delay (s)		34.6	20.7		39.4	21.8	38.9	23.0		105.9	15.8	
Level of Service		C	C		D	C	D	C		F	B	
Approach Delay (s)		26.9			32.0			23.9			23.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	76.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	0	50	10	0	10	25	1350	10	10	1050	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1695		3433	3535		1770	3534	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1695		3433	3535		1770	3534	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	0	54	11	0	11	27	1467	11	11	1141	11
RTOR Reduction (vph)	0	48	0	0	11	0	0	1	0	0	1	0
Lane Group Flow (vph)	109	6	0	0	11	0	27	1477	0	11	1151	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.3	6.3			1.0		1.3	25.8		0.6	25.1	
Effective Green, g (s)	6.3	6.3			1.0		1.3	25.8		0.6	25.1	
Actuated g/C Ratio	0.12	0.12			0.02		0.02	0.48		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	210	187			32		84	1714		20	1667	
v/s Ratio Prot	c0.06	0.00			c0.01		c0.01	c0.42		0.01	0.33	
v/s Ratio Perm												
v/c Ratio	0.52	0.03			0.35		0.32	0.86		0.55	0.69	
Uniform Delay, d1	22.0	20.8			25.8		25.5	12.1		26.2	11.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.0			2.4		0.8	5.3		17.2	1.8	
Delay (s)	22.9	20.8			28.2		26.3	17.4		43.4	12.8	
Level of Service	C	C			C		C	B		D	B	
Approach Delay (s)		22.2			28.2			17.6			13.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	14.2
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	10	160	170	30	70	100	1140	30	10	1100	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1778	1583		1787	1583	3433	3525		1770	3512	
Flt Permitted		0.50	1.00		0.51	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		938	1583		950	1583	3433	3525		1770	3512	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	11	174	185	33	76	109	1239	33	11	1196	65
RTOR Reduction (vph)	0	0	93	0	0	55	0	2	0	0	4	0
Lane Group Flow (vph)	0	228	81	0	218	21	109	1270	0	11	1257	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		21.8	21.8		21.8	21.8	3.8	43.5		0.7	40.4	
Effective Green, g (s)		21.8	21.8		21.8	21.8	3.8	43.5		0.7	40.4	
Actuated g/C Ratio		0.27	0.27		0.27	0.27	0.05	0.54		0.01	0.50	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		254	428		257	428	162	1902		15	1760	
v/s Ratio Prot							c0.03	c0.36		0.01	c0.36	
v/s Ratio Perm		c0.24	0.05		0.23	0.01						
v/c Ratio		0.90	0.19		0.85	0.05	0.67	0.67		0.73	0.71	
Uniform Delay, d1		28.3	22.6		27.8	21.7	37.8	13.4		39.9	15.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		30.1	0.1		21.3	0.0	8.3	1.3		93.0	1.9	
Delay (s)		58.5	22.7		49.1	21.7	46.1	14.7		132.8	17.5	
Level of Service		E	C		D	C	D	B		F	B	
Approach Delay (s)		43.0			42.0			17.2			18.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	19.9
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
19: Project Access & Ruffin Road

2035 PM
9/24/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1230	0	0	1030
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	1337	0	0	1120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.83	0.77			0.77	
vC, conflicting volume	1897	668			1337	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1063	0			847	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	181	838			607	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	0	668	668	0	560	560
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.39	0.39	0.00	0.33	0.33
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	0.0	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		37.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Signalized Intersection Capacity Analysis
20: Lightwave Avenue & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	100	320	100	120	200	280	800	40	120	670	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1688		3433	3514		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1688		3433	3514		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	109	348	109	130	217	304	870	43	130	728	261
RTOR Reduction (vph)	0	0	59	0	60	0	0	3	0	0	0	150
Lane Group Flow (vph)	250	109	289	109	287	0	304	910	0	130	728	111
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	10.0	23.2	35.7	8.0	21.8		12.5	29.9		10.8	28.2	38.2
Effective Green, g (s)	10.0	23.2	35.7	8.0	21.8		12.5	29.9		10.8	28.2	38.2
Actuated g/C Ratio	0.11	0.26	0.40	0.09	0.24		0.14	0.33		0.12	0.31	0.42
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	381	480	628	157	409		477	1167		212	1109	672
v/s Ratio Prot	c0.07	0.06	0.06	0.06	c0.17		c0.09	c0.26		0.07	0.21	0.02
v/s Ratio Perm			0.12									0.05
v/c Ratio	0.66	0.23	0.46	0.69	0.70		0.64	0.78		0.61	0.66	0.16
Uniform Delay, d1	38.4	26.3	20.0	39.8	31.1		36.6	27.1		37.6	26.7	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.2	0.5	12.5	5.4		2.8	3.4		5.2	1.4	0.1
Delay (s)	42.4	26.6	20.6	52.3	36.5		39.4	30.4		42.8	28.1	16.1
Level of Service	D	C	C	D	D		D	C		D	C	B
Approach Delay (s)		29.2			40.3			32.7			27.0	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	31.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	0	600	20	10	20	280	930	10	20	1050	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1803	1583	3433	3534		1770	3539	1583
Flt Permitted	0.95		1.00		0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1803	1583	3433	3534		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	0	652	22	11	22	304	1011	11	22	1141	98
RTOR Reduction (vph)	0	0	218	0	0	21	0	0	0	0	0	24
Lane Group Flow (vph)	207	0	434	0	33	1	304	1022	0	22	1141	74
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	10.0		20.1		4.3	4.3	10.1	46.8		1.5	38.2	38.2
Effective Green, g (s)	10.0		20.1		4.3	4.3	10.1	46.8		1.5	38.2	38.2
Actuated g/C Ratio	0.12		0.24		0.05	0.05	0.12	0.57		0.02	0.46	0.46
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	415		385		94	82	419	2000		32	1635	731
v/s Ratio Prot	0.06		c0.14		c0.02		0.09	0.29		0.01	c0.32	
v/s Ratio Perm			0.14			0.00						0.05
v/c Ratio	0.50		1.13		0.35	0.01	0.73	0.51		0.69	0.70	0.10
Uniform Delay, d1	34.0		31.3		37.9	37.2	35.0	11.0		40.4	17.7	12.6
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9		85.1		2.3	0.1	6.1	0.2		47.1	1.3	0.1
Delay (s)	35.0		116.4		40.1	37.3	41.1	11.2		87.5	19.0	12.6
Level of Service	C		F		D	D	D	B		F	B	B
Approach Delay (s)		96.8			39.0			18.0			19.7	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	19.2
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	1110	180	120	790	340	520	590	390	750	700	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4979		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1207	196	130	859	370	565	641	424	815	761	348
RTOR Reduction (vph)	0	15	0	0	0	55	0	0	127	0	0	140
Lane Group Flow (vph)	228	1388	0	130	859	315	565	641	297	815	761	208
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	19.6	42.8		12.0	35.4	70.2	26.9	34.6	34.6	34.8	42.6	42.6
Effective Green, g (s)	19.6	42.8		12.0	35.4	70.2	26.9	34.6	34.6	34.8	42.6	42.6
Actuated g/C Ratio	0.14	0.30		0.08	0.24	0.49	0.19	0.24	0.24	0.24	0.29	0.29
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	240	1473		147	1244	1352	638	846	379	826	1042	466
v/s Ratio Prot	c0.13	c0.28		0.07	0.17	0.06	0.16	0.18		c0.24	c0.22	
v/s Ratio Perm						0.06			0.19			0.13
v/c Ratio	0.95	0.94		0.88	0.69	0.23	0.89	0.76	0.78	0.99	0.73	0.45
Uniform Delay, d1	62.1	49.7		65.7	49.7	21.6	57.4	51.2	51.5	54.7	45.9	41.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	43.8	12.3		41.9	1.7	0.1	13.9	3.9	10.1	27.8	2.7	0.7
Delay (s)	105.8	62.0		107.6	51.3	21.7	71.3	55.1	61.7	82.5	48.6	42.2
Level of Service	F	E		F	D	C	E	E	E	F	D	D
Approach Delay (s)		68.1			48.7			62.4			61.8	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM Average Control Delay	60.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	144.7	Sum of lost time (s)	8.8
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

2035 PM
9/24/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	2000	40	50	850	230	50	20	600	500	40	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5070		1770	6203			1799	1583	1770	1612	
Flt Permitted	0.95	1.00		0.95	1.00			0.55	1.00	0.71	1.00	
Satd. Flow (perm)	1770	5070		1770	6203			1023	1583	1318	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	2174	43	54	924	250	54	22	652	543	43	380
RTOR Reduction (vph)	0	2	0	0	39	0	0	0	71	0	112	0
Lane Group Flow (vph)	76	2215	0	54	1135	0	0	76	581	543	311	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	8.4	50.0		4.4	47.0			48.2	48.2	48.2	48.2	
Effective Green, g (s)	8.4	50.0		4.4	47.0			48.2	48.2	48.2	48.2	
Actuated g/C Ratio	0.07	0.42		0.04	0.39			0.41	0.41	0.41	0.41	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	125	2130		65	2450			414	641	534	653	
v/s Ratio Prot	c0.04	c0.44		0.03	0.18						0.19	
v/s Ratio Perm								0.07	0.37	c0.41		
v/c Ratio	0.61	1.04		0.83	0.46			0.18	0.91	1.02	0.48	
Uniform Delay, d1	53.7	34.5		56.9	26.7			22.8	33.3	35.4	26.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.1	30.8		56.7	0.1			0.2	16.4	43.2	0.5	
Delay (s)	61.8	65.3		113.7	26.8			23.0	49.6	78.6	26.6	
Level of Service	E	E		F	C			C	D	E	C	
Approach Delay (s)		65.2			30.6			46.8			55.9	
Approach LOS		E			C			D			E	

Intersection Summary				
HCM Average Control Delay	52.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	118.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

2035 PM
9/24/2012

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	300	310	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	326	337	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	337				663	337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	337				663	337
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1222				426	705

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	326	337	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.19	0.20	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	300	310	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	326	337	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	337				663	337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	337				663	337
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1222				426	705

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	326	337	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.19	0.20	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

ILV ANALYSIS WORKSHEETS

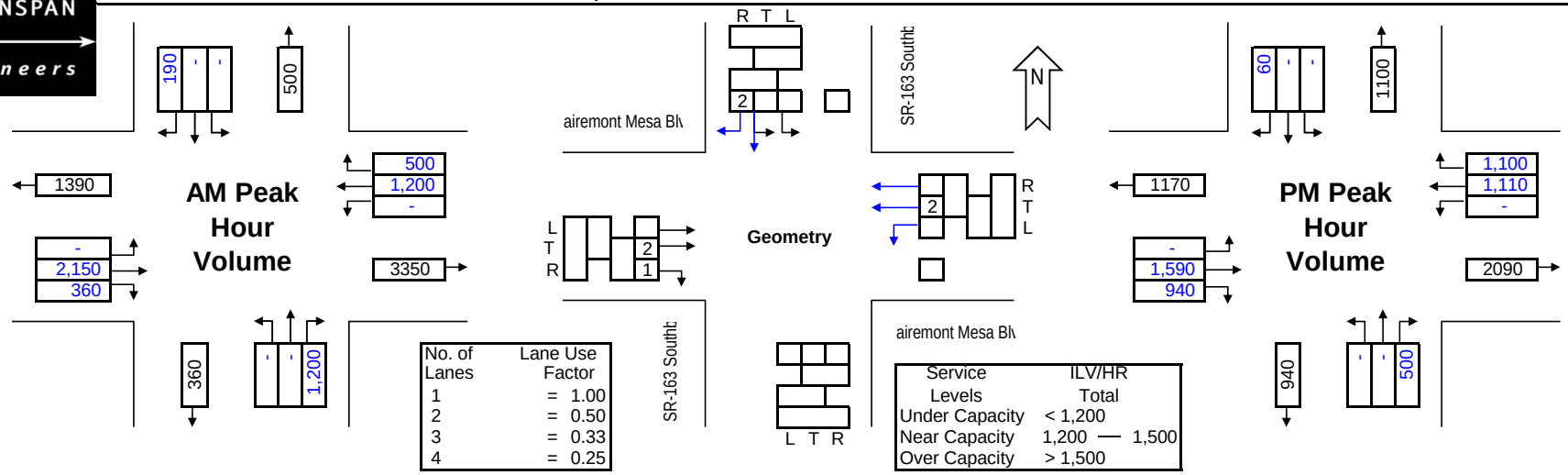
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



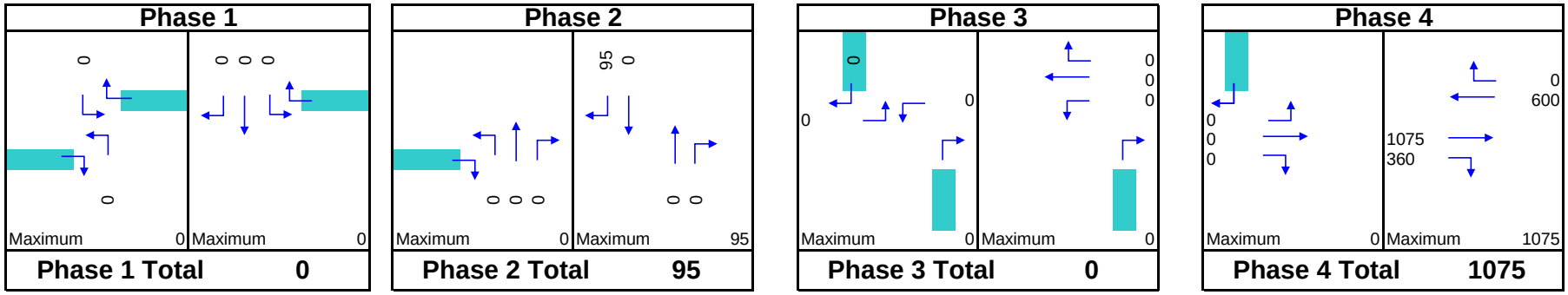
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1170

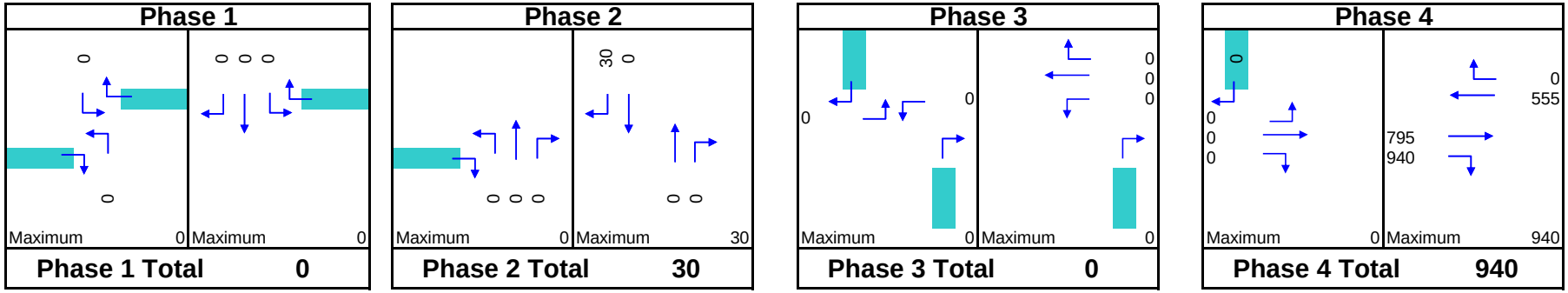
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 970

Service Level: **Under Capacity**



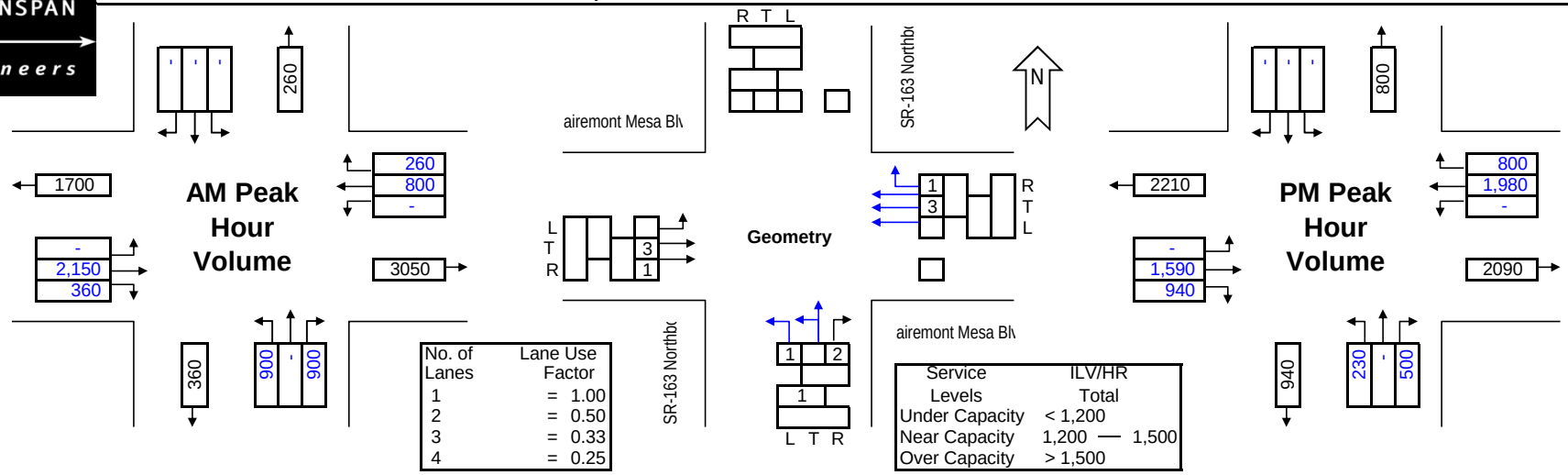
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



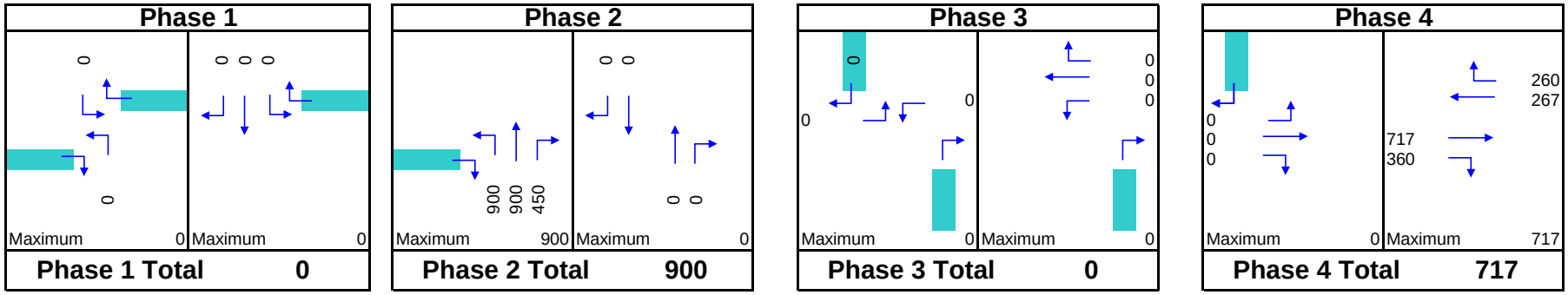
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1617

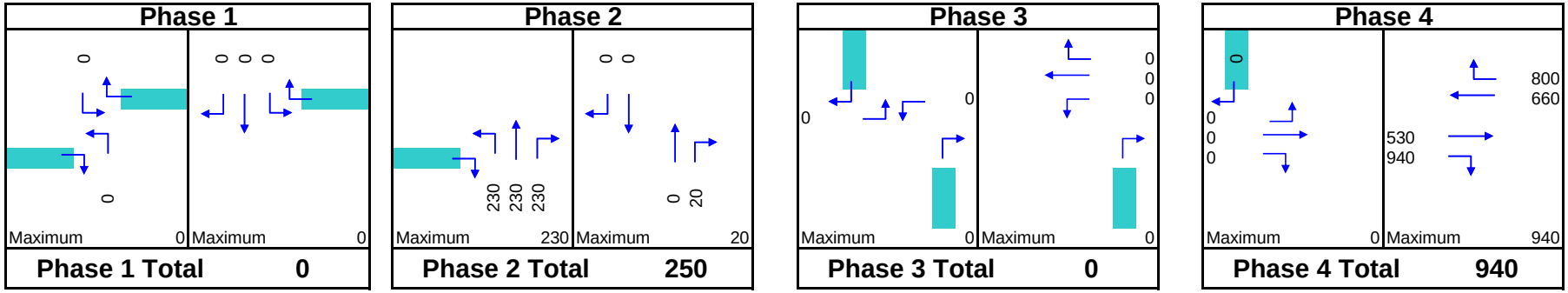
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1190

Service Level: **Under Capacity**



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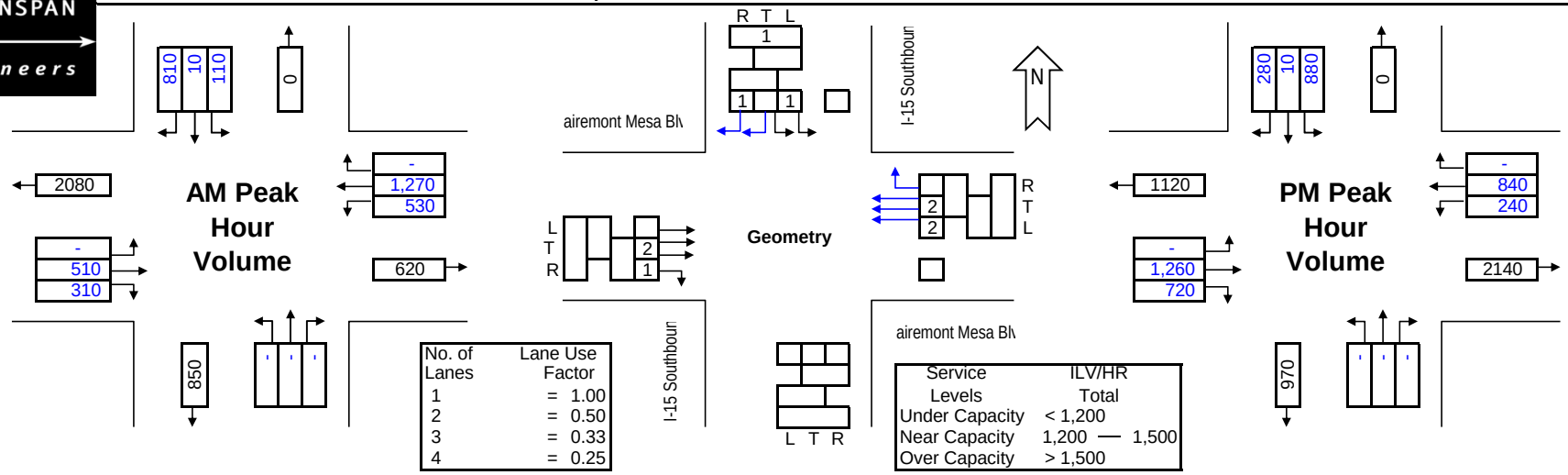
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



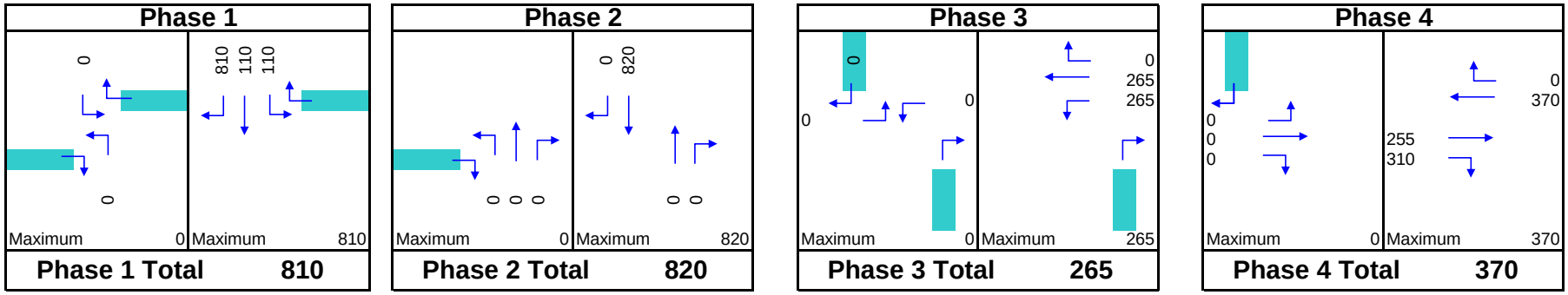
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 2265

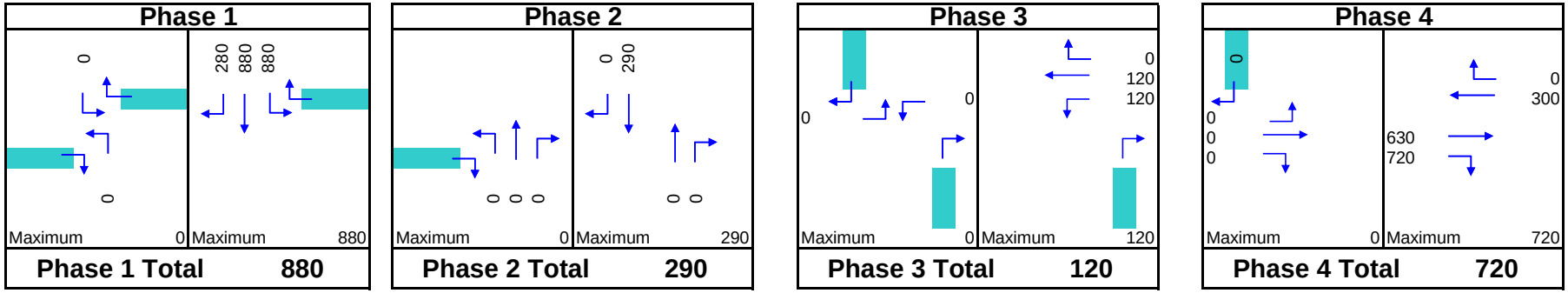
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 2010

Service Level: **Over Capacity**



LINSCOTT LAW & GREENSPAN engineers

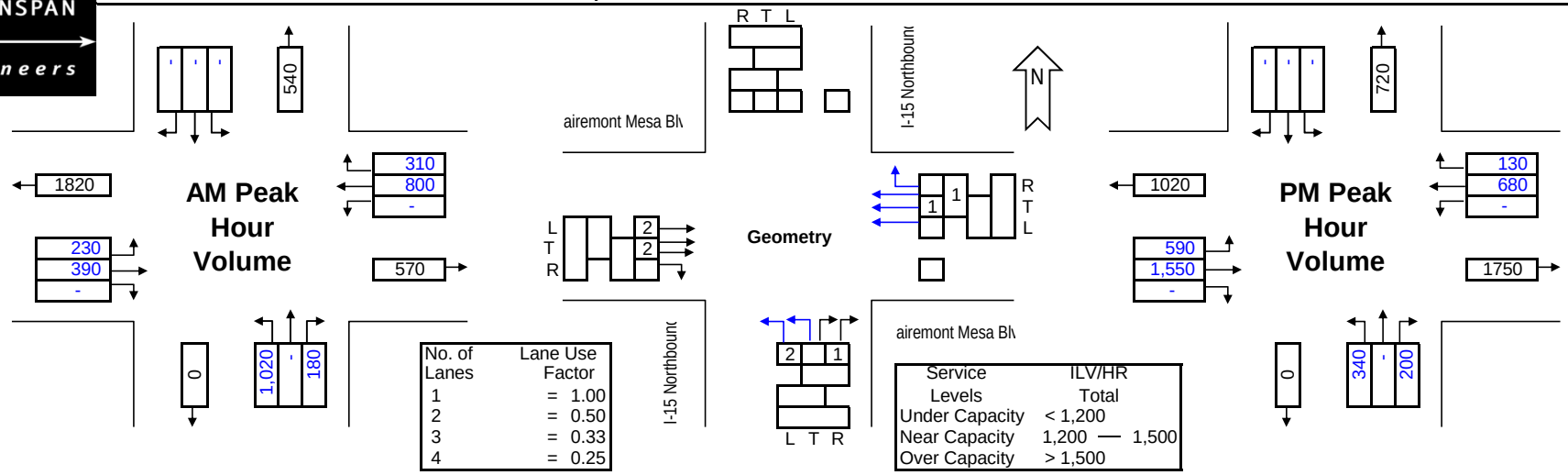
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

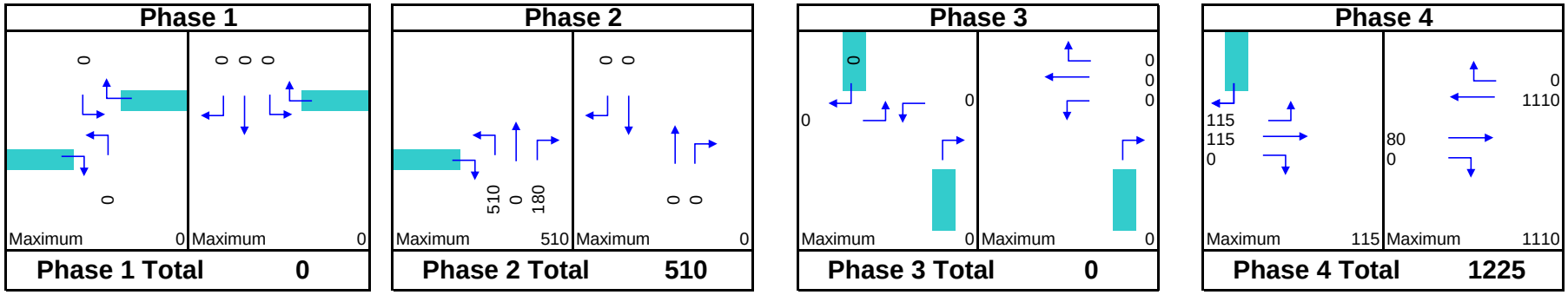
N/S
E/W



AM Peak Hour Analysis

Total Crictical Lane Volume 1735

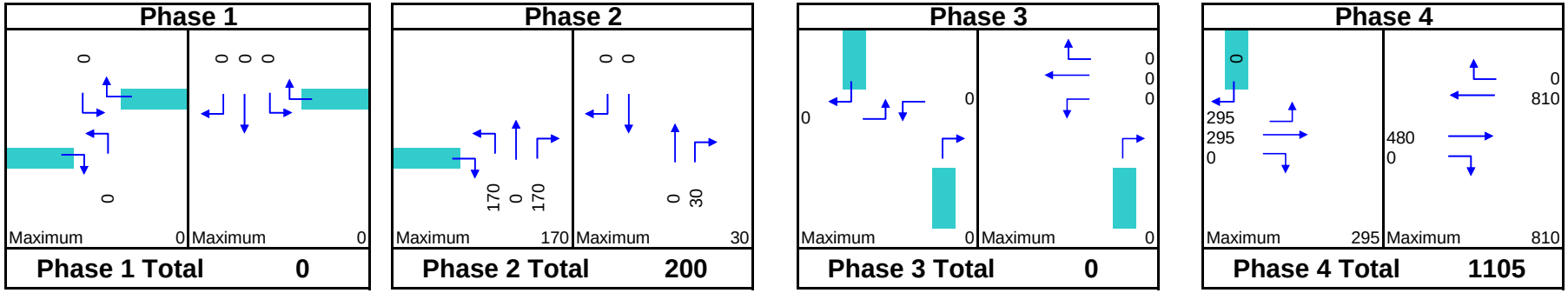
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1305

Service Level: **Near Capacity**



LINSCOTT LAW & GREENSPAN engineers

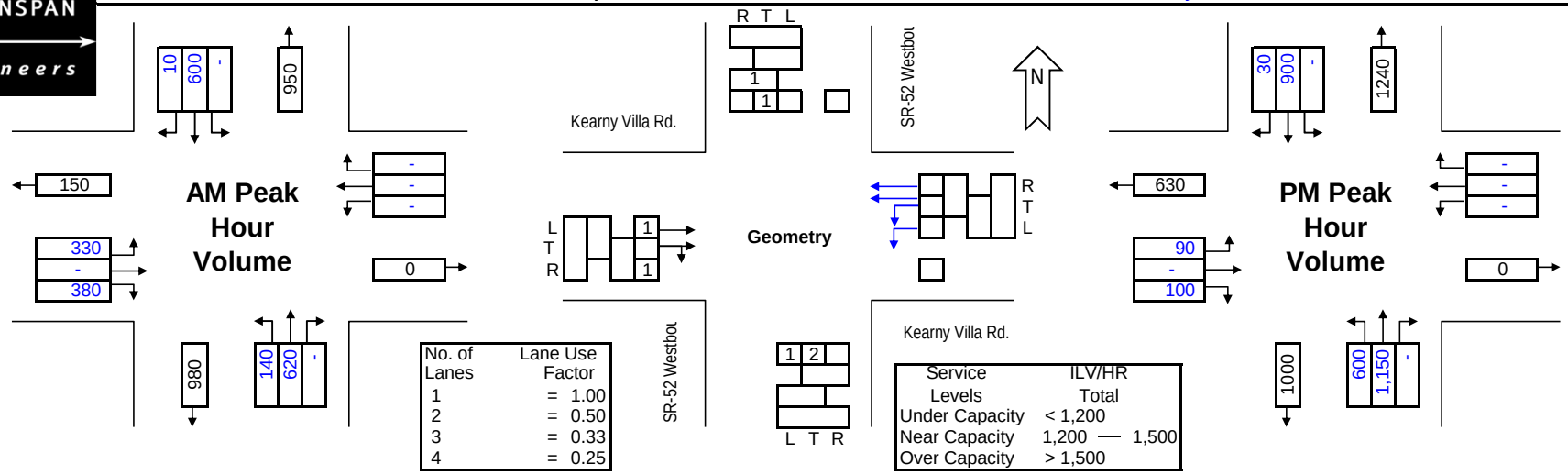
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps at Kearny Villa Rd.

N/S
E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

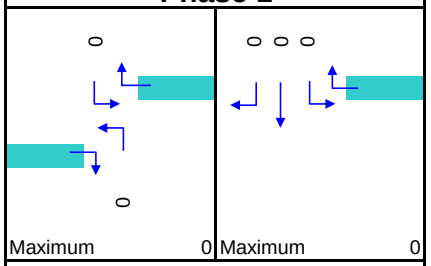
Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1130

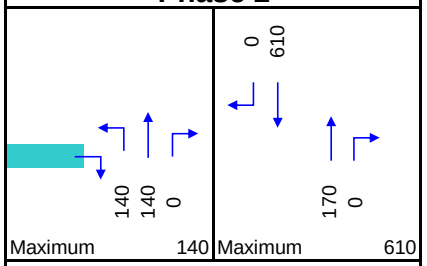
Service Level: **Under Capacity**

Phase 1



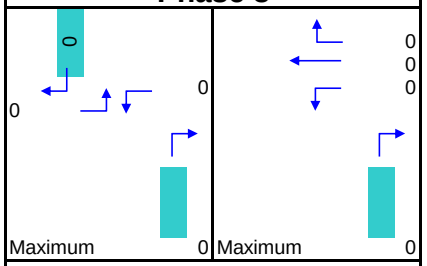
Phase 1 Total 0

Phase 2



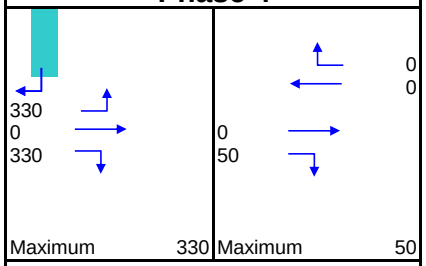
Phase 2 Total 750

Phase 3



Phase 3 Total 0

Phase 4



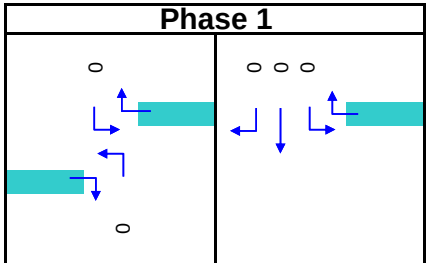
Phase 4 Total 380

PM Peak Hour Analysis

Total Crictical Lane Volume 1630

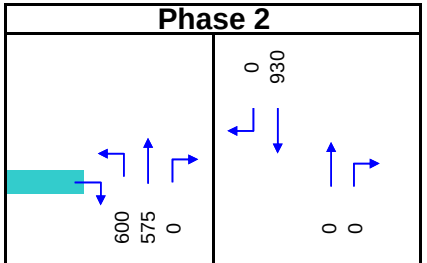
Service Level: **Over Capacity**

Phase 1



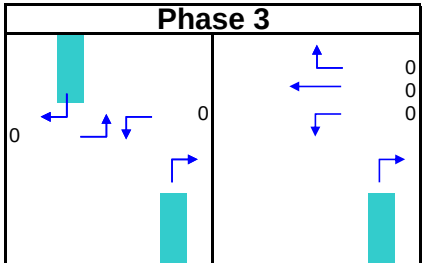
Phase 1 Total 0

Phase 2



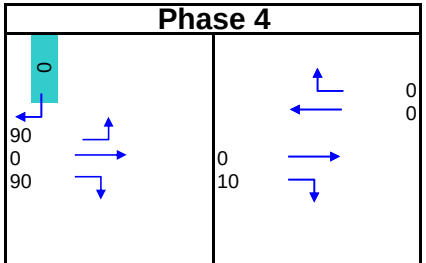
Phase 2 Total 1530

Phase 3



Phase 3 Total 0

Phase 4



Phase 4 Total 100

LINSCOTT LAW & GREENSPAN engineers

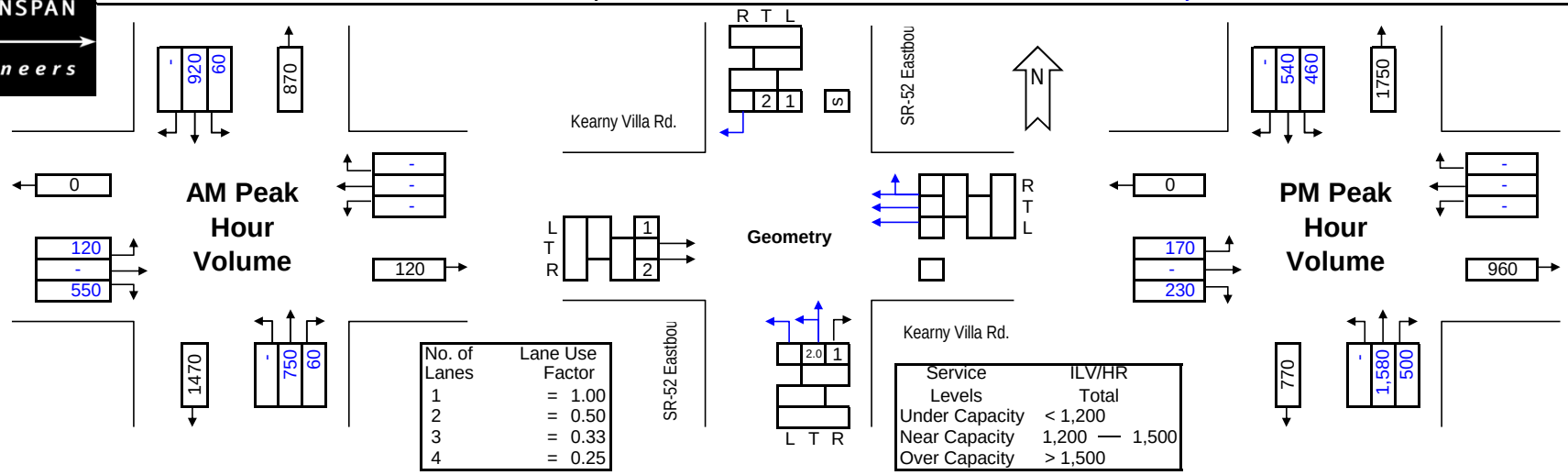
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps at Kearny Villa Rd.

N/S
E/W



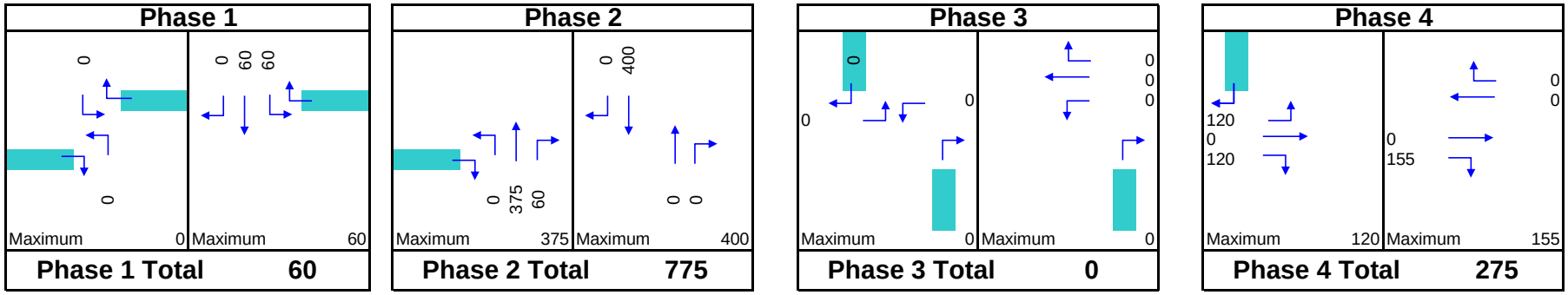
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1110

Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1420

Service Level: **Near Capacity**

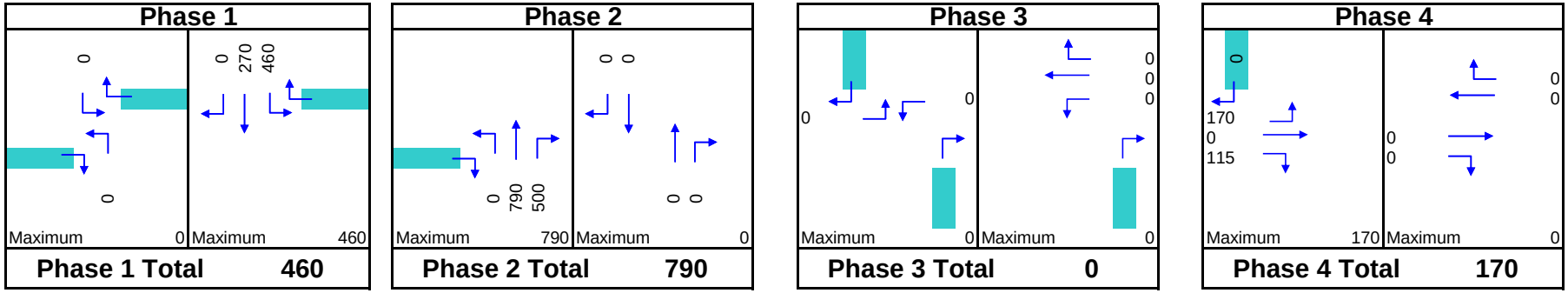


Table X
Year 2035 ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	1,170	Under Capacity
	PM	970	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,617	Over Capacity
	PM	1,190	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	2,265	Over Capacity
	PM	2,010	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,735	Over Capacity
	PM	1,305	Near Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	1,130	Under Capacity
	PM	1,630	Over Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	1,110	Under Capacity
	PM	1,420	Near Capacity

APPENDIX K

PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS AND ARTERIAL ANALYSIS – VIEW RIDGE AVENUE

- YEAR 2035 WITH PROJECT

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1173	25	300	1642	210	25	10	200	130	15	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.86	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	4999		1770	1530	1504	3433	3130	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	4999		1770	1530	1504	3433	3130	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1275	27	326	1785	228	27	11	217	141	16	54
RTOR Reduction (vph)	0	0	11	0	11	0	0	96	62	0	47	0
Lane Group Flow (vph)	43	1275	16	326	2002	0	27	19	51	141	23	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	6.3	58.8	66.6	14.7	66.6		2.5	8.4	23.1	8.9	15.1	
Effective Green, g (s)	6.3	58.8	66.6	14.7	66.6		2.5	8.4	23.1	8.9	15.1	
Actuated g/C Ratio	0.06	0.53	0.61	0.13	0.61		0.02	0.08	0.21	0.08	0.14	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	101	2718	958	459	3027		40	117	316	278	430	
v/s Ratio Prot	0.02	0.25		c0.09	c0.40		0.02	0.01	c0.02	c0.04	0.01	
v/s Ratio Perm			0.01						0.01			
v/c Ratio	0.43	0.47	0.02	0.71	0.66		0.68	0.16	0.16	0.51	0.05	
Uniform Delay, d1	50.1	15.9	8.7	45.6	14.3		53.3	47.5	35.5	48.4	41.2	
Progression Factor	1.00	1.00	1.00	1.12	0.75		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.6	0.0	4.2	0.6		29.9	0.2	0.1	0.5	0.0	
Delay (s)	51.2	16.5	8.7	55.2	11.3		83.3	47.7	35.6	49.0	41.3	
Level of Service	D	B	A	E	B		F	D	D	D	D	
Approach Delay (s)		17.4			17.4			46.1			46.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.2	
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB Off Ramp

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2153	360	0	1202	521	0	0	1206	0	0	290
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2340	391	0	1307	566	0	0	1311	0	0	315
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.92			0.83			0.87	0.87	0.83	0.87	0.87	0.92
vC, conflicting volume	1873			2732			3309	4213	1170	3788	4038	653
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1774			2676			2938	3978	794	3489	3777	448
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	0	0	100	39
cM capacity (veh/h)	319			127			2	3	274	0	3	513

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	1170	1170	391	653	653	566	1311	158	158
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	391	0	0	566	1311	158	158
cSH	1700	1700	1700	1700	1700	1700	274	513	513
Volume to Capacity	0.69	0.69	0.23	0.38	0.38	0.33	4.78	0.31	0.31
Queue Length 95th (ft)	0	0	0	0	0	0	Err	32	32
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	Err	15.1	15.1
Lane LOS							F	C	C
Approach Delay (s)	0.0			0.0			Err	15.1	
Approach LOS							F	C	

Intersection Summary			
Average Delay	2104.5		
Intersection Capacity Utilization	140.9%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
3: Clairemont Mesa Boulevard & SR 163 NB Ramps

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1989	220	0	823	264	900	0	929	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2162	239	0	895	287	978	0	1010	0	0	0
RTOR Reduction (vph)	0	0	122	0	0	146	0	0	2	0	0	0
Lane Group Flow (vph)	0	2162	117	0	895	141	489	489	1008	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		54.0	54.0		54.0	54.0	45.2	45.2	45.2			
Effective Green, g (s)		54.0	54.0		54.0	54.0	45.2	45.2	45.2			
Actuated g/C Ratio		0.49	0.49		0.49	0.49	0.41	0.41	0.41			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		2496	777		2496	777	691	691	1145			
v/s Ratio Prot		c0.43			0.18		0.29	0.29	c0.36			
v/s Ratio Perm			0.07			0.09						
v/c Ratio		0.87	0.15		0.36	0.18	0.71	0.71	0.88			
Uniform Delay, d1		24.8	15.4		17.3	15.6	26.9	26.9	29.9			
Progression Factor		0.86	0.51		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		4.3	0.4		0.4	0.5	3.3	3.3	8.1			
Delay (s)		25.7	8.2		17.7	16.2	30.2	30.2	38.0			
Level of Service		C	A		B	B	C	C	D			
Approach Delay (s)		24.0			17.3			34.2			0.0	
Approach LOS		C			B			C			A	

Intersection Summary				
HCM Average Control Delay	26.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Clairemont Mesa Boulevard & Kearny Villa Road

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	1687	1100	160	717	20	150	110	150	40	100	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	1834	1196	174	779	22	163	120	163	43	109	239
RTOR Reduction (vph)	0	0	0	0	0	12	0	0	86	0	0	110
Lane Group Flow (vph)	326	1834	1196	174	779	10	163	120	77	43	109	129
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	18.0	63.4	135.0	27.4	72.7	17.4	10.6	17.4	63.4	7.6	14.6	72.7
Effective Green, g (s)	18.0	63.4	135.0	27.4	72.7	17.4	10.6	17.4	63.4	7.6	14.6	72.7
Actuated g/C Ratio	0.13	0.47	1.00	0.20	0.54	0.13	0.08	0.13	0.47	0.06	0.11	0.54
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	458	2388	1583	359	2738	204	270	240	743	100	201	852
v/s Ratio Prot	0.09	0.36		0.10	0.15		0.05	0.06		0.02	0.06	
v/s Ratio Perm			c0.76			0.01			0.05			0.08
v/c Ratio	0.71	0.77	0.76	0.48	0.28	0.05	0.60	0.50	0.10	0.43	0.54	0.15
Uniform Delay, d1	56.0	29.7	0.0	47.6	17.0	51.5	60.2	54.7	20.0	61.6	57.0	15.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	2.4	3.4	1.0	0.3	0.1	3.8	1.6	0.3	3.0	3.0	0.4
Delay (s)	61.2	32.1	3.4	48.6	17.2	51.6	63.9	56.4	20.2	64.6	60.0	16.0
Level of Service	E	C	A	D	B	D	E	E	C	E	E	B
Approach Delay (s)		24.7			23.6			45.9			33.6	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	27.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	0.0	
Intersection Capacity Utilization	64.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1437	110	70	767	110	55	10	100	55	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5031		1770	4989			1787	1583		1787	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.74	1.00		0.74	1.00
Satd. Flow (perm)	1770	5031		1770	4989			1375	1583		1375	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1562	120	76	834	120	60	11	109	60	11	43
RTOR Reduction (vph)	0	7	0	0	14	0	0	0	104	0	0	41
Lane Group Flow (vph)	261	1675	0	76	940	0	0	71	5	0	71	2
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	20.8	79.4		8.6	67.2			5.0	5.0		5.0	5.0
Effective Green, g (s)	20.8	79.4		8.6	67.2			5.0	5.0		5.0	5.0
Actuated g/C Ratio	0.20	0.76		0.08	0.64			0.05	0.05		0.05	0.05
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	351	3804		145	3193			65	75		65	75
v/s Ratio Prot	c0.15	c0.33		0.04	0.19							
v/s Ratio Perm								c0.05	0.00		0.05	0.00
v/c Ratio	0.74	0.44		0.52	0.29			1.09	0.07		1.09	0.03
Uniform Delay, d1	39.6	4.7		46.2	8.4			50.0	47.8		50.0	47.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.3	0.4		3.4	0.2			139.3	0.4		139.3	0.1
Delay (s)	47.9	5.1		49.6	8.6			189.3	48.2		189.3	47.8
Level of Service	D	A		D	A			F	D		F	D
Approach Delay (s)		10.8			11.6			103.8			135.9	
Approach LOS		B			B			F			F	

Intersection Summary				
HCM Average Control Delay	20.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	937	320	190	687	80	170	180	100	40	30	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4891		3433	5085	1583	1770	3349		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4891		3433	5085	1583	1770	3349		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	348	1018	348	207	747	87	185	196	109	43	33	76
RTOR Reduction (vph)	0	46	0	0	0	50	0	53	0	0	0	52
Lane Group Flow (vph)	348	1320	0	207	747	37	185	252	0	43	33	24
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	18.3	43.0		11.9	36.5	36.5	19.0	54.0		7.4	42.4	42.4
Effective Green, g (s)	18.3	43.0		11.9	36.5	36.5	19.0	54.0		7.4	42.4	42.4
Actuated g/C Ratio	0.14	0.32		0.09	0.27	0.27	0.14	0.40		0.05	0.31	0.31
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	465	1558		303	1375	428	249	1340		97	585	497
v/s Ratio Prot	c0.10	c0.27		0.06	0.15		c0.10	c0.08		0.02	0.02	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.75	0.85		0.68	0.54	0.09	0.74	0.19		0.44	0.06	0.05
Uniform Delay, d1	56.1	42.9		59.7	42.1	36.8	55.7	26.3		61.8	32.3	32.2
Progression Factor	1.00	1.00		1.10	1.27	2.21	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	5.9		4.8	1.2	0.3	11.3	0.1		3.2	0.2	0.2
Delay (s)	62.6	48.8		70.2	54.6	81.4	67.0	26.3		65.0	32.5	32.4
Level of Service	E	D		E	D	F	E	C		E	C	C
Approach Delay (s)		51.6			60.0			41.7			41.7	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	52.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	560	320	520	721	398	132	321	187	250	510	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.95		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4808		3433	4814		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4808		3433	4814		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	609	348	565	784	433	143	349	203	272	554	163
RTOR Reduction (vph)	0	74	0	0	72	0	0	0	151	0	0	80
Lane Group Flow (vph)	435	883	0	565	1145	0	143	349	52	272	554	83
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	21.3	38.6		26.8	44.2		9.7	34.8	34.8	15.2	40.5	40.5
Effective Green, g (s)	21.3	38.6		26.8	44.2		9.7	34.8	34.8	15.2	40.5	40.5
Actuated g/C Ratio	0.16	0.29		0.20	0.33		0.07	0.26	0.26	0.11	0.30	0.30
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	542	1375		682	1576		247	912	408	387	1062	475
v/s Ratio Prot	0.13	0.18		c0.16	c0.24		0.04	0.10		c0.08	c0.16	
v/s Ratio Perm									0.03			0.05
v/c Ratio	0.80	0.64		0.83	0.73		0.58	0.38	0.13	0.70	0.52	0.18
Uniform Delay, d1	54.8	42.2		51.9	40.1		60.7	41.3	38.5	57.7	39.2	34.9
Progression Factor	1.13	1.34		1.11	0.87		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	1.8		7.7	2.8		3.3	1.2	0.6	5.7	1.8	0.8
Delay (s)	68.5	58.2		65.1	37.7		63.9	42.5	39.1	63.4	41.0	35.7
Level of Service	E	E		E	D		E	D	D	E	D	D
Approach Delay (s)		61.4			46.3			45.9			46.3	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	50.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	68.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

Year 2035 + Project AM
1/3/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	887	110	451	1635	39	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	964	120	490	1777	42	171
RTOR Reduction (vph)	0	33	0	0	0	39
Lane Group Flow (vph)	964	87	490	1777	42	132
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	87.4	96.0	25.0	116.9	8.6	33.6
Effective Green, g (s)	87.4	96.0	25.0	116.9	8.6	33.6
Actuated g/C Ratio	0.65	0.71	0.19	0.87	0.06	0.25
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3292	1126	636	4403	113	784
v/s Ratio Prot	0.19	0.00	c0.14	c0.35	c0.02	0.03
v/s Ratio Perm		0.05				0.02
v/c Ratio	0.29	0.08	0.77	0.40	0.37	0.17
Uniform Delay, d1	10.4	6.0	52.3	1.9	60.6	39.7
Progression Factor	1.32	1.38	1.11	0.86	1.00	1.00
Incremental Delay, d2	0.2	0.0	5.0	0.2	2.1	0.1
Delay (s)	13.9	8.2	63.1	1.8	62.7	39.8
Level of Service	B	A	E	A	E	D
Approach Delay (s)	13.3			15.1	44.3	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	16.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.8	
Intersection Capacity Utilization	45.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	849	150	470	1774	200	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	923	163	511	1928	217	98
RTOR Reduction (vph)	0	0	32	0	0	0	46
Lane Group Flow (vph)	0	923	131	511	1928	217	52
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		65.6	65.6	42.3	112.9	11.7	54.0
Effective Green, g (s)		65.6	65.6	42.3	112.9	11.7	54.0
Actuated g/C Ratio		0.49	0.49	0.31	0.84	0.09	0.40
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1720	769	555	4253	153	633
v/s Ratio Prot		c0.26		c0.29	0.38	c0.12	0.03
v/s Ratio Perm			0.08				0.01
v/c Ratio		0.54	0.17	0.92	0.45	1.42	0.08
Uniform Delay, d1		24.1	19.4	44.7	2.9	61.6	25.1
Progression Factor		0.85	0.73	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	0.5	20.8	0.4	222.1	0.1
Delay (s)		21.8	14.7	65.5	3.3	283.7	25.2
Level of Service		C	B	E	A	F	C
Approach Delay (s)		20.7			16.3	203.3	
Approach LOS		C			B	F	

Intersection Summary			
HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	535	404	530	1405	0	0	0	0	110	10	839
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1451	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1451	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	582	439	576	1527	0	0	0	0	120	11	912
RTOR Reduction (vph)	0	0	274	0	0	0	0	0	0	0	13	13
Lane Group Flow (vph)	0	582	165	576	1527	0	0	0	0	108	458	453
Turn Type			custom	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			4									4
Actuated Green, G (s)		30.1	37.5	20.4	54.5					37.5	37.5	37.5
Effective Green, g (s)		30.1	37.5	20.4	54.5					37.5	37.5	37.5
Actuated g/C Ratio		0.30	0.38	0.20	0.54					0.38	0.38	0.38
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1065	1045	700	1929					630	544	564
v/s Ratio Prot		0.16		0.17	c0.43					0.06	c0.32	
v/s Ratio Perm			0.06									0.30
v/c Ratio		0.55	0.16	0.82	0.79					0.17	0.84	0.80
Uniform Delay, d1		29.2	20.8	38.1	18.2					20.9	28.5	27.9
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		0.6	0.1	7.8	3.4					0.1	11.3	8.1
Delay (s)		29.8	20.8	45.8	21.6					21.0	39.8	36.0
Level of Service		C	C	D	C					C	D	D
Approach Delay (s)		26.0			28.3			0.0			36.2	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	111.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	251	394	0	0	806	310	1150	0	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.96		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3392		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3392		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	428	0	0	876	337	1250	0	196	0	0	0
RTOR Reduction (vph)	0	0	0	0	51	0	0	0	123	0	0	0
Lane Group Flow (vph)	273	428	0	0	1162	0	1250	0	74	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	7.6	40.0			28.2		30.0		30.0			
Effective Green, g (s)	7.6	40.0			28.2		30.0		30.0			
Actuated g/C Ratio	0.09	0.50			0.35		0.38		0.38			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	326	1770			1196		1287		594			
v/s Ratio Prot	c0.08	0.12			c0.34		c0.36					
v/s Ratio Perm									0.05			
v/c Ratio	0.84	0.24			0.97		0.97		0.12			
Uniform Delay, d1	35.6	11.4			25.5		24.6		16.4			
Progression Factor	1.00	1.00			1.00		1.00		1.00			
Incremental Delay, d2	16.8	0.3			20.1		18.5		0.1			
Delay (s)	52.4	11.7			45.6		43.1		16.5			
Level of Service	D	B			D		D		B			
Approach Delay (s)		27.6			45.6			39.5			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	111.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: Lightwave Avenue & Overland Avenue

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	162	80	120	228	250	80	150	50	170	350	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.92		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3364		1770	3262		1770	3407		1770	3404	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3364		1770	3262		1770	3407		1770	3404	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	176	87	130	248	272	87	163	54	185	380	130
RTOR Reduction (vph)	0	69	0	0	210	0	0	35	0	0	35	0
Lane Group Flow (vph)	130	194	0	130	310	0	87	182	0	185	475	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.9	14.0		9.1	15.2		6.4	13.2		11.4	18.2	
Effective Green, g (s)	7.9	14.0		9.1	15.2		6.4	13.2		11.4	18.2	
Actuated g/C Ratio	0.12	0.21		0.14	0.23		0.10	0.20		0.17	0.27	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	211	710		243	748		171	678		304	934	
v/s Ratio Prot	c0.07	0.06		0.07	c0.10		0.05	0.05		c0.10	c0.14	
v/s Ratio Perm												
v/c Ratio	0.62	0.27		0.53	0.41		0.51	0.27		0.61	0.51	
Uniform Delay, d1	27.8	21.9		26.6	21.8		28.5	22.5		25.4	20.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.2		1.1	0.4		0.9	0.2		2.4	0.5	
Delay (s)	31.5	22.1		27.8	22.2		29.3	22.7		27.7	20.8	
Level of Service	C	C		C	C		C	C		C	C	
Approach Delay (s)		25.2			23.3			24.6			22.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	8.8
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	330	389	157	620	600	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3530	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3530	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	423	171	674	652	11
RTOR Reduction (vph)	0	222	0	0	1	0
Lane Group Flow (vph)	359	201	171	674	662	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	21.3	21.3	12.4	47.4	30.8	
Effective Green, g (s)	21.3	21.3	12.4	47.4	30.8	
Actuated g/C Ratio	0.27	0.27	0.16	0.59	0.39	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	471	421	274	2097	1359	
v/s Ratio Prot	c0.20		c0.10	0.19	c0.19	
v/s Ratio Perm		0.13				
v/c Ratio	0.76	0.48	0.62	0.32	0.49	
Uniform Delay, d1	27.0	24.7	31.6	8.2	18.6	
Progression Factor	1.00	1.00	1.01	1.86	1.00	
Incremental Delay, d2	7.2	0.9	4.0	0.4	1.3	
Delay (s)	34.2	25.5	35.9	15.6	19.9	
Level of Service	C	C	D	B	B	
Approach Delay (s)	29.5			19.7	19.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	0	573	0	0	0	0	767	66	60	929	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1770	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1770	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	0	623	0	0	0	0	834	72	65	1010	0
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	38	0	0	0
Lane Group Flow (vph)	0	130	502	0	0	0	0	834	34	65	1010	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		20.1	20.1					37.9	37.9	6.5	48.6	
Effective Green, g (s)		20.1	20.1					37.9	37.9	6.5	48.6	
Actuated g/C Ratio		0.25	0.25					0.47	0.47	0.08	0.61	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		445	700					1677	750	144	2150	
v/s Ratio Prot								0.24		0.04	c0.29	
v/s Ratio Perm		0.07	c0.18						0.02			
v/c Ratio		0.29	0.72					0.50	0.05	0.45	0.47	
Uniform Delay, d1		24.2	27.4					14.5	11.3	35.0	8.6	
Progression Factor		1.00	1.00					1.00	1.00	1.07	0.83	
Incremental Delay, d2		0.4	3.5					1.1	0.1	1.9	0.6	
Delay (s)		24.6	30.9					15.5	11.4	39.3	7.8	
Level of Service		C	C					B	B	D	A	
Approach Delay (s)		29.8			0.0			15.2			9.7	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	80	60	10	10	10	20	673	60	100	1122	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1742	1583	1770	1723		1770	3496		3433	3433	
Flt Permitted	0.95	0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1742	1583	1770	1723		1770	3496		3433	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	87	65	11	11	11	22	732	65	109	1220	304
RTOR Reduction (vph)	0	0	54	0	11	0	0	8	0	0	25	0
Lane Group Flow (vph)	122	128	11	11	11	0	22	789	0	109	1499	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.6	10.6	10.6	1.2	1.2		1.2	31.8		4.6	35.2	
Effective Green, g (s)	10.6	10.6	10.6	1.2	1.2		1.2	31.8		4.6	35.2	
Actuated g/C Ratio	0.17	0.17	0.17	0.02	0.02		0.02	0.50		0.07	0.55	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	278	288	261	33	32		33	1732		246	1882	
v/s Ratio Prot	0.07	c0.07		0.01	c0.01		0.01	0.23		c0.03	c0.44	
v/s Ratio Perm			0.01									
v/c Ratio	0.44	0.44	0.04	0.33	0.35		0.67	0.46		0.44	0.80	
Uniform Delay, d1	24.1	24.1	22.5	31.1	31.1		31.3	10.6		28.6	11.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.1	0.1	5.9	6.5		40.8	0.2		1.3	2.4	
Delay (s)	25.2	25.2	22.6	37.0	37.6		72.1	10.7		29.8	14.1	
Level of Service	C	C	C	D	D		E	B		C	B	
Approach Delay (s)		24.7			37.4			12.4			15.1	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM Average Control Delay	15.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	80	40	30	70	120	120	573	50	190	832	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1583		1835	1583	1770	3497		1770	3468	
Flt Permitted		0.91	1.00		0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1686	1583		1613	1583	1770	3497		1770	3468	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	87	43	33	76	130	130	623	54	207	904	141
RTOR Reduction (vph)	0	0	37	0	0	110	0	5	0	0	10	0
Lane Group Flow (vph)	0	109	6	0	109	20	130	672	0	207	1035	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		9.7	9.7		10.3	10.3	10.3	29.9		13.4	33.0	
Effective Green, g (s)		9.7	9.7		10.3	10.3	10.3	29.9		13.4	33.0	
Actuated g/C Ratio		0.14	0.14		0.15	0.15	0.15	0.44		0.20	0.48	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		240	225		244	239	267	1533		348	1678	
v/s Ratio Prot							0.07	0.19		c0.12	c0.30	
v/s Ratio Perm		0.06	0.00		c0.07	0.01						
v/c Ratio		0.45	0.03		0.45	0.08	0.49	0.44		0.59	0.62	
Uniform Delay, d1		26.8	25.2		26.4	24.9	26.5	13.3		24.9	12.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5	0.0		0.5	0.1	0.5	0.3		1.8	0.8	
Delay (s)		27.3	25.2		26.8	24.9	27.0	13.6		26.7	13.8	
Level of Service		C	C		C	C	C	B		C	B	
Approach Delay (s)		26.7			25.8			15.8			15.9	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	17.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	14.6	
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	30	10	0	0	50	723	10	10	832	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			1.00		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1770		3433	3532		1770	3493	
Flt Permitted	0.95	1.00			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1770		3433	3532		1770	3493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	33	11	0	0	54	786	11	11	904	87
RTOR Reduction (vph)	0	32	0	0	0	0	0	1	0	0	4	0
Lane Group Flow (vph)	33	1	0	0	11	0	54	796	0	11	987	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.9	1.9			0.8		1.5	19.8		0.5	18.8	
Effective Green, g (s)	1.9	1.9			0.8		1.5	19.8		0.5	18.8	
Actuated g/C Ratio	0.04	0.04			0.02		0.04	0.47		0.01	0.44	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	79	71			33		121	1645		21	1545	
v/s Ratio Prot	c0.02	0.00			c0.01		c0.02	0.23		0.01	c0.28	
v/s Ratio Perm												
v/c Ratio	0.42	0.02			0.33		0.45	0.48		0.52	0.64	
Uniform Delay, d1	19.8	19.4			20.6		20.1	7.8		20.9	9.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.0			2.2		1.0	0.6		10.4	1.4	
Delay (s)	21.1	19.5			22.8		21.0	8.4		31.3	10.6	
Level of Service	C	B			C		C	A		C	B	
Approach Delay (s)		20.3			22.8			9.2			10.8	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	19.5
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	15	25	30	20	10	220	793	90	40	702	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1802	1583		1808	1583	3433	3485		1770	3462	
Flt Permitted		0.86	1.00		0.82	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1599	1583		1528	1583	3433	3485		1770	3462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	16	27	33	22	11	239	862	98	43	763	130
RTOR Reduction (vph)	0	0	25	0	0	10	0	7	0	0	13	0
Lane Group Flow (vph)	0	49	2	0	55	1	239	953	0	43	880	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		3.9	3.9		3.9	3.9	6.6	29.4		1.4	24.2	
Effective Green, g (s)		3.9	3.9		3.9	3.9	6.6	29.4		1.4	24.2	
Actuated g/C Ratio		0.08	0.08		0.08	0.08	0.13	0.60		0.03	0.49	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		126	125		121	125	460	2078		50	1699	
v/s Ratio Prot							c0.07	0.27		0.02	c0.25	
v/s Ratio Perm		0.03	0.00		c0.04	0.00						
v/c Ratio		0.39	0.02		0.45	0.01	0.52	0.46		0.86	0.52	
Uniform Delay, d1		21.6	20.9		21.7	20.9	19.9	5.5		23.9	8.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0		1.0	0.0	0.4	0.4		74.2	0.7	
Delay (s)		22.3	21.0		22.7	20.9	20.3	5.9		98.0	9.2	
Level of Service		C	C		C	C	C	A		F	A	
Approach Delay (s)		21.8			22.4			8.8			13.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	14.6
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	28	612	80	0	1357
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	30	665	87	0	1475
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.90	0.96			0.96	
vC, conflicting volume	1403	333			752	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	995	209			648	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	217	762			892	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	30	333	333	87	738	738
Volume Left	0	0	0	0	0	0
Volume Right	30	0	0	87	0	0
cSH	762	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.20	0.20	0.05	0.43	0.43
Queue Length 95th (ft)	3	0	0	0	0	0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.9	0.0			0.0	
Approach LOS	A					

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	40.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	120	140	68	114	132	320	400	140	380	627	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1713		3433	3402		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1713		3433	3402		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	130	152	74	124	143	348	435	152	413	682	359
RTOR Reduction (vph)	0	0	62	0	44	0	0	31	0	0	0	207
Lane Group Flow (vph)	109	130	90	74	223	0	348	556	0	413	682	152
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	5.2	16.9	30.5	5.3	17.6		13.6	19.3		25.0	30.7	35.9
Effective Green, g (s)	5.2	16.9	30.5	5.3	17.6		13.6	19.3		25.0	30.7	35.9
Actuated g/C Ratio	0.06	0.20	0.36	0.06	0.21		0.16	0.23		0.30	0.36	0.42
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	211	372	571	111	356		552	776		523	1284	672
v/s Ratio Prot	0.03	0.07	0.03	c0.04	c0.13		0.10	c0.16		c0.23	0.19	0.01
v/s Ratio Perm			0.03									0.08
v/c Ratio	0.52	0.35	0.16	0.67	0.63		0.63	0.72		0.79	0.53	0.23
Uniform Delay, d1	38.5	29.1	18.3	38.8	30.5		33.2	30.1		27.4	21.3	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	0.6	0.1	14.1	3.4		2.3	3.2		7.8	0.4	0.2
Delay (s)	40.6	29.7	18.5	52.9	34.0		35.5	33.3		35.2	21.7	15.7
Level of Service	D	C	B	D	C		D	C		D	C	B
Approach Delay (s)		28.4			38.1			34.1			24.0	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	29.1	HCM Level of Service		C
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	84.6	Sum of lost time (s)		13.5
Intersection Capacity Utilization	68.6%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	10	160	10	0	10	550	790	50	15	715	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583		1770	1583	3433	3508		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583		1770	1583	3433	3508		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	11	174	11	0	11	598	859	54	16	777	196
RTOR Reduction (vph)	0	0	116	0	0	11	0	3	0	0	0	77
Lane Group Flow (vph)	87	11	58	0	11	0	598	910	0	16	777	119
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	5.6	5.6	24.2		2.2	2.2	18.6	44.3		0.6	26.3	26.3
Effective Green, g (s)	5.6	5.6	24.2		2.2	2.2	18.6	44.3		0.6	26.3	26.3
Actuated g/C Ratio	0.08	0.08	0.33		0.03	0.03	0.26	0.61		0.01	0.36	0.36
Clearance Time (s)	5.3	5.3	4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	264	143	526		53	48	877	2135		15	1279	572
v/s Ratio Prot	c0.03	0.01	0.03		c0.01		c0.17	0.26		0.01	c0.22	
v/s Ratio Perm			0.01			0.00						0.07
v/c Ratio	0.33	0.08	0.11		0.21	0.01	0.68	0.43		1.07	0.61	0.21
Uniform Delay, d1	31.8	31.2	16.8		34.4	34.2	24.4	7.5		36.1	19.0	16.1
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.1		1.9	0.1	2.2	0.1		255.5	0.8	0.2
Delay (s)	32.6	31.4	16.9		36.4	34.3	26.6	7.7		291.6	19.9	16.2
Level of Service	C	C	B		D	C	C	A		F	B	B
Approach Delay (s)		22.5			35.3			15.2			23.5	
Approach LOS		C			D			B			C	

Intersection Summary				
HCM Average Control Delay	19.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	20.1	
Intersection Capacity Utilization	57.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Year 2035 + Project AM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	276	310	490	640	1070	732	120	503	70	158	502	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4618		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4618		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	300	337	533	696	1163	796	130	547	76	172	546	157
RTOR Reduction (vph)	0	102	0	0	0	132	0	0	58	0	0	103
Lane Group Flow (vph)	300	768	0	696	1163	664	130	547	18	172	546	54
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	24.0	26.8		37.0	40.0	45.7	9.0	28.5	28.5	5.7	25.3	25.3
Effective Green, g (s)	24.0	26.8		37.0	40.0	45.7	9.0	28.5	28.5	5.7	25.3	25.3
Actuated g/C Ratio	0.20	0.23		0.31	0.34	0.39	0.08	0.24	0.24	0.05	0.21	0.21
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	358	1044		553	1716	1075	261	851	381	165	756	338
v/s Ratio Prot	0.17	0.17		c0.39	c0.23	0.03	0.04	c0.15		c0.05	c0.15	
v/s Ratio Perm						0.21			0.01			0.03
v/c Ratio	0.84	1.16dr		1.26	0.68	0.62	0.50	0.64	0.05	1.04	0.72	0.16
Uniform Delay, d1	45.4	42.6		40.8	33.7	29.4	52.6	40.4	34.6	56.4	43.3	37.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	2.7		130.5	1.1	1.1	1.5	1.7	0.1	81.7	3.4	0.2
Delay (s)	61.0	45.3		171.2	34.8	30.4	54.1	42.1	34.6	138.1	46.8	38.2
Level of Service	E	D		F	C	C	D	D	C	F	D	D
Approach Delay (s)		49.3			69.3			43.4			63.2	
Approach LOS		D			E			D			E	

Intersection Summary				
HCM Average Control Delay	60.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	19.5	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
dr Defacto Right Lane. Recode with 1 though lane as a right lane.				
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	328	60	750	2332	623	10	40	80	117	80	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.86			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4968		1770	6205			1844	1583	1770	1707	
Flt Permitted	0.95	1.00		0.95	1.00			0.77	1.00	0.72	1.00	
Satd. Flow (perm)	1770	4968		1770	6205			1439	1583	1345	1707	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	357	65	815	2535	677	11	43	87	127	87	109
RTOR Reduction (vph)	0	14	0	0	24	0	0	0	75	0	33	0
Lane Group Flow (vph)	163	408	0	815	3188	0	0	54	12	127	163	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases							4		4	4		
Actuated Green, G (s)	16.4	35.7		66.0	86.3			18.6	18.6	18.6	18.6	
Effective Green, g (s)	16.4	35.7		66.0	86.3			18.6	18.6	18.6	18.6	
Actuated g/C Ratio	0.12	0.26		0.48	0.63			0.14	0.14	0.14	0.14	
Clearance Time (s)	4.4	7.1		4.4	6.1			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	212	1297		855	3917			196	215	183	232	
v/s Ratio Prot	0.09	0.08		c0.46	c0.51						c0.10	
v/s Ratio Perm								0.04	0.01	0.09		
v/c Ratio	0.77	0.31		0.95	0.81			0.28	0.06	0.69	0.70	
Uniform Delay, d1	58.3	40.7		33.9	19.1			53.0	51.4	56.3	56.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.4	0.1		20.2	1.4			0.8	0.1	10.8	9.3	
Delay (s)	73.7	40.8		54.0	20.5			53.8	51.5	67.2	65.7	
Level of Service	E	D		D	C			D	D	E	E	
Approach Delay (s)		50.0			27.3			52.4			66.3	
Approach LOS		D			C			D			E	

Intersection Summary				
HCM Average Control Delay	33.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	136.7	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	78.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	150	370	241	50	18	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	402	262	54	20	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	316				1017	289
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316				1017	289
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				91	92
cM capacity (veh/h)	1244				229	750

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	402	316	77
Volume Left	163	0	0	20
Volume Right	0	0	54	58
cSH	1244	1700	1700	475
Volume to Capacity	0.13	0.24	0.19	0.16
Queue Length 95th (ft)	11	0	0	14
Control Delay (s)	8.3	0.0	0.0	14.0
Lane LOS	A			B
Approach Delay (s)	2.4		0.0	14.0
Approach LOS				B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	30	358	280	30	11	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	389	304	33	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	337				775	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	337				775	321
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				97	98
cM capacity (veh/h)	1222				357	720

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	389	337	24
Volume Left	33	0	0	12
Volume Right	0	0	33	12
cSH	1222	1700	1700	477
Volume to Capacity	0.03	0.23	0.20	0.05
Queue Length 95th (ft)	2	0	0	4
Control Delay (s)	8.0	0.0	0.0	12.9
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	12.9
Approach LOS				B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
1: Clairemont Mesa Boulevard & Kearny Mesa Rd

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1753	60	250	1205	150	40	10	550	230	20	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	0.95	0.95	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.86	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5001		1770	1514	1504	3433	3162	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5001		1770	1514	1504	3433	3162	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1905	65	272	1310	163	43	11	598	250	22	54
RTOR Reduction (vph)	0	0	19	0	10	0	0	137	10	0	43	0
Lane Group Flow (vph)	54	1905	46	272	1463	0	43	167	295	250	33	0
Turn Type	Prot		custom	Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	7.0	69.2	75.8	14.2	75.8		6.2	18.7	32.9	13.7	26.5	
Effective Green, g (s)	7.0	69.2	75.8	14.2	75.8		6.2	18.7	32.9	13.7	26.5	
Actuated g/C Ratio	0.05	0.51	0.56	0.11	0.56		0.05	0.14	0.24	0.10	0.20	
Clearance Time (s)	4.4	5.2	5.8	4.4	5.8		4.4	5.2	4.4	4.4	4.9	
Vehicle Extension (s)	2.0	3.7	3.9	2.0	3.9		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	92	2607	889	361	2808		81	210	367	348	621	
v/s Ratio Prot	0.03	c0.37		0.08	0.29		0.02	0.11	c0.08	c0.07	0.01	
v/s Ratio Perm			0.03						0.11			
v/c Ratio	0.59	0.73	0.05	0.75	0.52		0.53	0.80	0.80	0.72	0.05	
Uniform Delay, d1	62.6	25.6	13.4	58.7	18.3		63.0	56.3	48.0	58.8	44.1	
Progression Factor	1.00	1.00	1.00	0.99	1.03		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.0	1.8	0.0	7.2	0.2		3.3	17.4	11.4	5.8	0.0	
Delay (s)	68.6	27.5	13.4	65.5	19.1		66.3	73.7	59.4	64.6	44.1	
Level of Service	E	C	B	E	B		E	E	E	E	D	
Approach Delay (s)		28.1			26.3			66.5			59.8	
Approach LOS		C			C			E			E	

Intersection Summary				
HCM Average Control Delay	34.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.4	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
2: Clairemont Mesa Boulevard & SR 163 SB off-Ramp

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1593	940	0	1115	1151	0	0	506	0	0	160
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1732	1022	0	1212	1251	0	0	550	0	0	174
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		260			986							
pX, platoon unblocked	0.87			0.71			0.77	0.77	0.71	0.77	0.77	0.87
vC, conflicting volume	2463			2753			2511	4195	866	2628	3965	606
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2385			2652			1626	3804	0	1777	3507	257
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	28	100	100	73
cM capacity (veh/h)	174			111			38	3	769	11	5	648

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	866	866	1022	606	606	1251	550	87	87
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	1022	0	0	1251	550	87	87
cSH	1700	1700	1700	1700	1700	1700	769	648	648
Volume to Capacity	0.51	0.51	0.60	0.36	0.36	0.74	0.72	0.13	0.13
Queue Length 95th (ft)	0	0	0	0	0	0	154	12	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	20.5	11.4	11.4
Lane LOS							C	B	B
Approach Delay (s)	0.0			0.0			20.5	11.4	
Approach LOS							C	B	

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis — 2035 + Proj PM
3: Clairemont Mesa Boulevard & SR 163 NB Ramps
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1219	880	0	2036	810	230	0	530	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.88			
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1681	2787			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1681	2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1325	957	0	2213	880	250	0	576	0	0	0
RTOR Reduction (vph)	0	0	248	0	0	228	0	0	143	0	0	0
Lane Group Flow (vph)	0	1325	709	0	2213	652	125	125	433	0	0	0
Turn Type			Perm			Perm	Split		Prot			
Protected Phases		2			6		8	8	8			
Permitted Phases			2			6						
Actuated Green, G (s)		100.0	100.0		100.0	100.0	24.2	24.2	24.2			
Effective Green, g (s)		100.0	100.0		100.0	100.0	24.2	24.2	24.2			
Actuated g/C Ratio		0.74	0.74		0.74	0.74	0.18	0.18	0.18			
Clearance Time (s)		6.3	6.3		6.3	6.3	4.5	4.5	4.5			
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3767	1173		3767	1173	301	301	500			
v/s Ratio Prot		0.26			0.44		0.07	0.07	c0.16			
v/s Ratio Perm			c0.45			0.41						
v/c Ratio		0.35	0.60		0.59	0.56	0.42	0.42	0.87			
Uniform Delay, d1		6.1	8.2		8.0	7.7	49.1	49.1	53.8			
Progression Factor		0.72	1.78		0.18	7.50	1.00	1.00	1.00			
Incremental Delay, d2		0.2	2.0		0.3	0.9	0.9	0.9	14.6			
Delay (s)		4.6	16.6		1.8	58.8	50.1	50.1	68.4			
Level of Service		A	B		A	E	D	D	E			
Approach Delay (s)		9.6			18.0			62.9			0.0	
Approach LOS		A			B			E			A	

Intersection Summary				
HCM Average Control Delay	20.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	65.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — 2035 + Proj PM
4: Clairemont Mesa Boulevard & Kearny Villa Road
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	998	450	200	1866	50	550	150	300	60	115	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0	4.0	4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	1085	489	217	2028	54	598	163	326	65	125	467
RTOR Reduction (vph)	0	0	0	0	0	10	0	0	201	0	0	278
Lane Group Flow (vph)	326	1085	489	217	2028	44	598	163	125	65	125	189
Turn Type	Prot		Free	Prot		custom	Prot		custom	Prot		custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			8			2			6
Actuated Green, G (s)	17.8	51.9	135.0	20.7	54.7	34.1	28.1	34.1	51.9	9.1	15.3	54.7
Effective Green, g (s)	17.8	51.9	135.0	20.7	54.7	34.1	28.1	34.1	51.9	9.1	15.3	54.7
Actuated g/C Ratio	0.13	0.38	1.00	0.15	0.41	0.25	0.21	0.25	0.38	0.07	0.11	0.41
Clearance Time (s)	4.4	5.0		4.4	5.1	5.4	4.4	5.4	5.0	4.4	5.2	5.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	453	1955	1583	271	2060	400	715	471	609	119	211	641
v/s Ratio Prot	0.09	0.21		c0.12	c0.40		c0.17	0.09		0.04	c0.07	
v/s Ratio Perm			c0.31			0.03			0.08			0.12
v/c Ratio	0.72	0.55	0.31	0.80	0.98	0.11	0.84	0.35	0.21	0.55	0.59	0.30
Uniform Delay, d1	56.2	32.5	0.0	55.2	39.7	38.8	51.2	41.3	27.8	61.0	56.9	27.1
Progression Factor	1.13	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	1.0	0.4	15.5	16.5	0.1	8.4	0.4	0.8	5.0	4.4	1.2
Delay (s)	68.5	32.6	0.4	70.6	56.2	38.9	59.7	41.8	28.5	66.0	61.3	28.3
Level of Service	E	C	A	E	E	D	E	D	C	E	E	C
Approach Delay (s)		30.5			57.2			47.6			38.3	
Approach LOS		C			E			D			D	

Intersection Summary				
HCM Average Control Delay	44.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Clairemont Mesa Boulevard & Complex Street

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1238	50	110	1666	50	100	10	70	90	10	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5056		1770	5063			1782	1583		1783	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.58	1.00		0.55	1.00
Satd. Flow (perm)	1770	5056		1770	5063			1081	1583		1024	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1346	54	120	1811	54	109	11	76	98	11	98
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	65	0	0	83
Lane Group Flow (vph)	120	1397	0	120	1863	0	0	120	11	0	109	15
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	12.9	72.1		12.9	72.1			17.0	17.0		17.0	17.0
Effective Green, g (s)	12.9	72.1		12.9	72.1			17.0	17.0		17.0	17.0
Actuated g/C Ratio	0.11	0.63		0.11	0.63			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	200	3198		200	3202			161	236		153	236
v/s Ratio Prot	c0.07	0.28		0.07	c0.37							
v/s Ratio Perm								c0.11	0.01		0.11	0.01
v/c Ratio	0.60	0.44		0.60	0.58			0.75	0.05		0.71	0.06
Uniform Delay, d1	48.1	10.6		48.1	12.2			46.4	41.6		46.2	41.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.8	0.4		4.8	0.8			17.0	0.1		14.5	0.1
Delay (s)	52.9	11.1		52.9	13.0			63.4	41.6		60.7	41.8
Level of Service	D	B		D	B			E	D		E	D
Approach Delay (s)		14.4			15.4			55.0			51.7	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	18.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: Clairemont Mesa Boulevard & Overland Avenue

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1138	200	250	966	50	280	100	170	100	180	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4971		3433	5085	1583	1770	3205		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4971		3433	5085	1583	1770	3205		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1237	217	272	1050	54	304	109	185	109	196	348
RTOR Reduction (vph)	0	18	0	0	0	22	0	121	0	0	0	147
Lane Group Flow (vph)	163	1436	0	272	1050	32	304	173	0	109	196	201
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	10.6	45.0		12.6	46.9	46.9	22.7	46.9		11.8	36.0	36.0
Effective Green, g (s)	10.6	45.0		12.6	46.9	46.9	22.7	46.9		11.8	36.0	36.0
Actuated g/C Ratio	0.08	0.33		0.09	0.35	0.35	0.17	0.35		0.09	0.27	0.27
Clearance Time (s)	4.4	5.0		4.4	5.1	5.1	4.4	4.9		4.4	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	270	1657		320	1767	550	298	1113		155	497	422
v/s Ratio Prot	0.05	c0.29		c0.08	0.21		c0.17	0.05		0.06	0.11	
v/s Ratio Perm						0.02						c0.13
v/c Ratio	0.60	0.87		0.85	0.59	0.06	1.02	0.16		0.70	0.39	0.48
Uniform Delay, d1	60.2	42.2		60.3	36.2	29.3	56.1	30.4		59.9	40.6	41.6
Progression Factor	1.00	1.00		1.03	1.20	1.73	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	6.4		14.6	1.1	0.2	57.4	0.1		13.5	2.3	3.8
Delay (s)	63.9	48.6		76.9	44.6	50.9	113.5	30.5		73.4	42.9	45.4
Level of Service	E	D		E	D	D	F	C		E	D	D
Approach Delay (s)		50.1			51.2			72.7			49.3	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	53.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.7	
Intersection Capacity Utilization	74.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	932	318	261	626	213	363	846	235	627	532	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4891		3433	4891		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4891		3433	4891		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	380	1013	346	284	680	232	395	920	255	682	578	348
RTOR Reduction (vph)	0	46	0	0	46	0	0	0	121	0	0	158
Lane Group Flow (vph)	380	1313	0	284	866	0	395	920	134	682	578	190
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			4
Actuated Green, G (s)	17.2	38.8		12.3	34.0		20.1	36.4	36.4	27.9	44.4	44.4
Effective Green, g (s)	17.2	38.8		12.3	34.0		20.1	36.4	36.4	27.9	44.4	44.4
Actuated g/C Ratio	0.13	0.29		0.09	0.25		0.15	0.27	0.27	0.21	0.33	0.33
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	437	1406		313	1232		511	954	427	709	1164	521
v/s Ratio Prot	c0.11	c0.27		0.08	0.18		0.12	c0.26		c0.20	0.16	
v/s Ratio Perm									0.08			0.12
v/c Ratio	0.87	0.93		0.91	0.70		0.77	0.96	0.31	0.96	0.50	0.36
Uniform Delay, d1	57.8	46.9		60.8	45.9		55.3	48.7	39.3	53.0	36.3	34.5
Progression Factor	1.10	1.66		0.82	0.90		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.6	9.8		27.8	3.3		7.2	21.7	1.9	24.6	1.5	2.0
Delay (s)	76.3	87.5		77.4	44.6		62.4	70.4	41.3	77.7	37.9	36.5
Level of Service	E	F		E	D		E	E	D	E	D	D
Approach Delay (s)		85.1			52.4			63.6			54.4	
Approach LOS		F			D			E			D	

Intersection Summary				
HCM Average Control Delay	65.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.4	
Intersection Capacity Utilization	90.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
8: Clairemont Mesa Boulevard & Project Access

2035 + Proj PM
1/3/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1735	59	297	961	139	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1886	64	323	1045	151	753
RTOR Reduction (vph)	0	19	0	0	0	6
Lane Group Flow (vph)	1886	45	323	1045	151	747
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	77.9	94.7	26.3	108.7	16.8	43.1
Effective Green, g (s)	77.9	94.7	26.3	108.7	16.8	43.1
Actuated g/C Ratio	0.58	0.70	0.19	0.81	0.12	0.32
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2934	1110	669	4094	220	981
v/s Ratio Prot	c0.37	0.01	0.09	0.21	0.09	c0.15
v/s Ratio Perm		0.02				0.12
v/c Ratio	0.64	0.04	0.48	0.26	0.69	0.76
Uniform Delay, d1	19.2	6.2	48.3	3.2	56.6	41.3
Progression Factor	0.77	0.00	0.87	1.36	1.00	1.00
Incremental Delay, d2	0.5	0.0	0.5	0.1	8.6	3.5
Delay (s)	15.3	0.0	42.7	4.5	65.2	44.9
Level of Service	B	A	D	A	E	D
Approach Delay (s)	14.8			13.5	48.3	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1751	250	240	1049	200	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.95	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		3539	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		3539	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1903	272	261	1140	217	565
RTOR Reduction (vph)	0	0	17	0	0	0	0
Lane Group Flow (vph)	0	1903	255	261	1140	217	565
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		65.4	65.4	31.6	102.0	22.6	54.2
Effective Green, g (s)		65.4	65.4	31.6	102.0	22.6	54.2
Actuated g/C Ratio		0.48	0.48	0.23	0.76	0.17	0.40
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1714	767	414	3842	296	636
v/s Ratio Prot		c0.54		0.15	0.22	0.12	c0.21
v/s Ratio Perm			0.16				0.15
v/c Ratio		1.11	0.33	0.63	0.30	0.73	0.89
Uniform Delay, d1		34.8	21.4	46.5	5.2	53.3	37.6
Progression Factor		1.17	1.33	1.00	1.00	1.00	1.00
Incremental Delay, d2		56.4	0.8	3.1	0.2	9.0	14.2
Delay (s)		97.0	29.2	49.6	5.4	62.4	51.8
Level of Service		F	C	D	A	E	D
Approach Delay (s)		88.5			13.6	54.7	
Approach LOS		F			B	D	

Intersection Summary			
HCM Average Control Delay	58.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1321	950	240	979	0	0	0	0	880	10	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	0.88	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.99	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		3539	2787	3433	3539					1681	1605	1504
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		3539	2787	3433	3539					1681	1605	1504
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1436	1033	261	1064	0	0	0	0	957	11	337
RTOR Reduction (vph)	0	0	581	0	0	0	0	0	0	0	3	63
Lane Group Flow (vph)	0	1436	452	261	1064	0	0	0	0	507	492	240
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		35.0	35.0	7.0	46.0					26.0	26.0	26.0
Effective Green, g (s)		35.0	35.0	7.0	46.0					26.0	26.0	26.0
Actuated g/C Ratio		0.44	0.44	0.09	0.58					0.32	0.32	0.32
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1548	1219	300	2035					546	522	489
v/s Ratio Prot		c0.41		c0.08	0.30					0.30	c0.31	
v/s Ratio Perm			0.16									0.16
v/c Ratio		0.93	0.37	0.87	0.52					0.93	0.94	0.49
Uniform Delay, d1		21.3	15.1	36.1	10.3					26.1	26.3	21.7
Progression Factor		1.00	1.00	1.31	1.16					1.00	1.00	1.00
Incremental Delay, d2		10.0	0.2	17.7	0.7					22.1	25.5	0.8
Delay (s)		31.3	15.3	65.1	12.7					48.2	51.8	22.5
Level of Service		C	B	E	B					D	D	C
Approach Delay (s)		24.6			23.0			0.0			43.6	
Approach LOS		C			C			A			D	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — 2035 + Proj PM
11: Clairemont Mesa Boulevard & I-15 NB On-Ramp — 1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	641	1560	0	0	686	130	473	0	200	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0			6.0		4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95		0.97		1.00			
Frt	1.00	1.00			0.98		1.00		0.85			
Flt Protected	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (prot)	3433	3539			3455		3433		1583			
Flt Permitted	0.95	1.00			1.00		0.95		1.00			
Satd. Flow (perm)	3433	3539			3455		3433		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	697	1696	0	0	746	141	514	0	217	0	0	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	30	0	0	0
Lane Group Flow (vph)	697	1696	0	0	868	0	514	0	187	0	0	0
Turn Type	Prot						Prot		custom			
Protected Phases	5	2			6		4					
Permitted Phases									4			
Actuated Green, G (s)	20.0	54.8			30.6		15.2		15.2			
Effective Green, g (s)	20.0	54.8			30.6		15.2		15.2			
Actuated g/C Ratio	0.25	0.68			0.38		0.19		0.19			
Clearance Time (s)	4.2	6.0			6.0		4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	858	2424			1322		652		301			
v/s Ratio Prot	c0.20	c0.48			0.25		c0.15					
v/s Ratio Perm									0.12			
v/c Ratio	0.81	0.70			0.66		0.79		0.62			
Uniform Delay, d1	28.2	7.6			20.4		30.9		29.8			
Progression Factor	0.87	1.68			1.00		1.00		1.00			
Incremental Delay, d2	2.2	0.6			2.6		6.3		4.0			
Delay (s)	26.7	13.4			22.9		37.2		33.7			
Level of Service	C	B			C		D		C			
Approach Delay (s)		17.3			22.9			36.1			0.0	
Approach LOS		B			C			D			A	

Intersection Summary				
HCM Average Control Delay	22.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.2	
Intersection Capacity Utilization	99.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis — 2035 + Proj PM
12: Lightwave Avenue & Overland Avenue — 1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	212	100	80	240	230	100	200	130	320	220	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.93		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3369		1770	3279		1770	3330		1770	3352	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3369		1770	3279		1770	3330		1770	3352	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	230	109	87	261	250	109	217	141	348	239	130
RTOR Reduction (vph)	0	54	0	0	170	0	0	109	0	0	66	0
Lane Group Flow (vph)	152	285	0	87	341	0	109	249	0	348	303	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.0	19.2		6.9	15.1		7.7	12.7		21.1	26.1	
Effective Green, g (s)	11.0	19.2		6.9	15.1		7.7	12.7		21.1	26.1	
Actuated g/C Ratio	0.14	0.24		0.09	0.19		0.10	0.16		0.27	0.33	
Clearance Time (s)	4.4	4.9		4.4	4.9		4.4	4.9		4.4	4.9	
Vehicle Extension (s)	2.0	3.3		2.0	3.3		2.0	3.3		2.0	3.3	
Lane Grp Cap (vph)	248	824		156	631		174	539		476	1114	
v/s Ratio Prot	c0.09	c0.08		0.05	c0.10		0.06	c0.07		c0.20	0.09	
v/s Ratio Perm												
v/c Ratio	0.61	0.35		0.56	0.54		0.63	0.46		0.73	0.27	
Uniform Delay, d1	31.7	24.5		34.3	28.6		34.0	29.8		26.1	19.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.3		2.4	1.0		5.0	0.7		4.9	0.1	
Delay (s)	34.9	24.8		36.8	29.5		39.0	30.5		31.1	19.4	
Level of Service	C	C		D	C		D	C		C	B	
Approach Delay (s)		27.9			30.6			32.5			25.0	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	23.5	
Intersection Capacity Utilization	64.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: SR 52 WB Ramps & Kearny Villa Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	90	109	641	1150	900	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	6.7	6.7	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	3539	3522	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	3539	3522	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	118	697	1250	978	33
RTOR Reduction (vph)	0	107	0	0	2	0
Lane Group Flow (vph)	98	11	697	1250	1009	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	12.4	12.4	56.9	111.3	50.2	
Effective Green, g (s)	12.4	12.4	56.9	111.3	50.2	
Actuated g/C Ratio	0.09	0.09	0.42	0.82	0.37	
Clearance Time (s)	4.6	4.6	4.2	6.7	6.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	163	145	746	2918	1310	
v/s Ratio Prot	c0.06		c0.39	0.35	c0.29	
v/s Ratio Perm		0.01				
v/c Ratio	0.60	0.07	0.93	0.43	0.77	
Uniform Delay, d1	58.9	56.1	37.3	3.2	37.3	
Progression Factor	1.00	1.00	1.07	2.88	1.00	
Incremental Delay, d2	6.1	0.2	2.5	0.0	4.4	
Delay (s)	65.0	56.3	42.3	9.3	41.7	
Level of Service	E	E	D	A	D	
Approach Delay (s)	60.3			21.1	41.7	
Approach LOS	E			C	D	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
14: EB Off-Ramp & Kearny Villa Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	10	254	0	0	0	0	1621	515	460	549	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Lane Util. Factor		1.00	0.88					0.95	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1779	2787					3539	1583	1770	3539	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1779	2787					3539	1583	1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	11	276	0	0	0	0	1762	560	500	597	0
RTOR Reduction (vph)	0	0	243	0	0	0	0	0	177	0	0	0
Lane Group Flow (vph)	0	196	33	0	0	0	0	1762	383	500	597	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2			
Actuated Green, G (s)		16.0	16.0					66.3	66.3	37.2	107.7	
Effective Green, g (s)		16.0	16.0					66.3	66.3	37.2	107.7	
Actuated g/C Ratio		0.12	0.12					0.49	0.49	0.28	0.80	
Clearance Time (s)		4.6	4.6					6.7	6.7	4.2	6.7	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		211	330					1738	777	488	2823	
v/s Ratio Prot								c0.50		c0.28	0.17	
v/s Ratio Perm		0.11	0.01						0.24			
v/c Ratio		0.93	0.10					1.01	0.49	1.02	0.21	
Uniform Delay, d1		58.9	53.1					34.4	23.1	48.9	3.3	
Progression Factor		1.00	1.00					1.00	1.00	1.55	0.18	
Incremental Delay, d2		42.0	0.1					25.1	2.2	39.6	0.1	
Delay (s)		101.0	53.2					59.4	25.3	115.5	0.7	
Level of Service		F	D					E	C	F	A	
Approach Delay (s)		73.0			0.0			51.2			53.0	
Approach LOS		E			A			D			D	

Intersection Summary			
HCM Average Control Delay	54.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
15: Kearny Villa Road & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	420	10	30	50	40	90	40	1606	10	20	653	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00		1.00	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1689	1583	1770	1669		1770	3536		3433	3451	
Flt Permitted	0.95	0.95	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1689	1583	1770	1669		1770	3536		3433	3451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	11	33	54	43	98	43	1746	11	22	710	141
RTOR Reduction (vph)	0	0	27	0	90	0	0	0	0	0	19	0
Lane Group Flow (vph)	233	235	6	54	51	0	43	1757	0	22	832	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.0	14.0	14.0	4.0	4.0		3.4	40.3		1.5	38.4	
Effective Green, g (s)	14.0	14.0	14.0	4.0	4.0		3.4	40.3		1.5	38.4	
Actuated g/C Ratio	0.18	0.18	0.18	0.05	0.05		0.04	0.53		0.02	0.51	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	310	312	292	93	88		79	1880		68	1748	
v/s Ratio Prot	0.14	c0.14		0.03	c0.03		c0.02	c0.50		0.01	0.24	
v/s Ratio Perm			0.00									
v/c Ratio	0.75	0.75	0.02	0.58	0.58		0.54	0.93		0.32	0.48	
Uniform Delay, d1	29.3	29.3	25.3	35.1	35.1		35.4	16.5		36.6	12.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	9.9	0.0	8.9	8.9		7.5	9.2		2.8	0.2	
Delay (s)	39.1	39.1	25.3	44.0	44.0		42.9	25.7		39.4	12.4	
Level of Service	D	D	C	D	D		D	C		D	B	
Approach Delay (s)		38.2			44.0			26.1			13.0	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM Average Control Delay	25.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	75.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
16: Chesapeake Drive & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	30	160	180	120	220	80	1356	40	70	713	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.96	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794	1583		1808	1583	1770	3524		1770	3498	
Flt Permitted		0.39	1.00		0.74	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		717	1583		1370	1583	1770	3524		1770	3498	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	33	174	196	130	239	87	1474	43	76	775	65
RTOR Reduction (vph)	0	0	125	0	0	86	0	2	0	0	7	0
Lane Group Flow (vph)	0	142	49	0	326	153	87	1515	0	76	833	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		21.2	21.2		21.8	21.8	5.6	36.5		3.6	34.5	
Effective Green, g (s)		21.2	21.2		21.8	21.8	5.6	36.5		3.6	34.5	
Actuated g/C Ratio		0.28	0.28		0.28	0.28	0.07	0.48		0.05	0.45	
Clearance Time (s)		5.5	5.5		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	4.3		2.0	4.2	
Lane Grp Cap (vph)		199	439		390	451	130	1681		83	1578	
v/s Ratio Prot							c0.05	c0.43		0.04	0.24	
v/s Ratio Perm		0.20	0.03		c0.24	0.10						
v/c Ratio		0.71	0.11		0.84	0.34	0.67	0.90		0.92	0.53	
Uniform Delay, d1		24.9	20.6		25.7	21.7	34.5	18.3		36.3	15.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.6	0.0		13.8	0.2	9.7	7.3		69.6	0.5	
Delay (s)		34.6	20.7		39.4	21.8	44.2	25.7		105.9	15.6	
Level of Service		C	C		D	C	D	C		F	B	
Approach Delay (s)		26.9			32.0			26.7			23.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	26.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: Hazard Way & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	0	50	10	0	10	25	1406	10	10	1083	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Lane Util. Factor	1.00	1.00			1.00		0.97	0.95		1.00	0.95	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583			1695		3433	3535		1770	3534	
Flt Permitted	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583			1695		3433	3535		1770	3534	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	0	54	11	0	11	27	1528	11	11	1177	11
RTOR Reduction (vph)	0	48	0	0	11	0	0	1	0	0	1	0
Lane Group Flow (vph)	109	6	0	0	11	0	27	1538	0	11	1187	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.3	6.3			1.0		1.3	25.8		0.6	25.1	
Effective Green, g (s)	6.3	6.3			1.0		1.3	25.8		0.6	25.1	
Actuated g/C Ratio	0.12	0.12			0.02		0.02	0.48		0.01	0.47	
Clearance Time (s)	4.9	4.9			4.9		4.4	5.3		4.4	5.3	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)	210	187			32		84	1714		20	1667	
v/s Ratio Prot	c0.06	0.00			c0.01		c0.01	c0.44		0.01	0.34	
v/s Ratio Perm												
v/c Ratio	0.52	0.03			0.35		0.32	0.90		0.55	0.71	
Uniform Delay, d1	22.0	20.8			25.8		25.5	12.5		26.2	11.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.0			2.4		0.8	7.3		17.2	2.0	
Delay (s)	22.9	20.8			28.2		26.3	19.8		43.4	13.2	
Level of Service	C	C			C		C	B		D	B	
Approach Delay (s)		22.2			28.2			19.9			13.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	14.2
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Farnham St & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	10	160	170	30	70	100	1196	30	10	1133	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Lane Util. Factor		1.00	1.00		1.00	1.00	0.97	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1778	1583		1787	1583	3433	3526		1770	3513	
Flt Permitted		0.57	1.00		0.58	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1069	1583		1086	1583	3433	3526		1770	3513	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	11	174	185	33	76	109	1300	33	11	1232	65
RTOR Reduction (vph)	0	0	126	0	0	55	0	2	0	0	4	0
Lane Group Flow (vph)	0	228	48	0	218	21	109	1331	0	11	1293	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		14.7	14.7		14.7	14.7	3.0	23.2		0.7	20.9	
Effective Green, g (s)		14.7	14.7		14.7	14.7	3.0	23.2		0.7	20.9	
Actuated g/C Ratio		0.28	0.28		0.28	0.28	0.06	0.44		0.01	0.39	
Clearance Time (s)		4.9	4.9		4.9	4.9	4.4	5.3		4.4	5.3	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	5.7		2.0	5.7	
Lane Grp Cap (vph)		295	437		300	437	194	1538		23	1380	
v/s Ratio Prot							c0.03	c0.38		0.01	0.37	
v/s Ratio Perm		c0.21	0.03		0.20	0.01						
v/c Ratio		0.77	0.11		0.73	0.05	0.56	0.87		0.48	0.94	
Uniform Delay, d1		17.7	14.4		17.4	14.1	24.5	13.6		26.1	15.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.9	0.0		7.2	0.0	2.2	6.0		5.6	12.7	
Delay (s)		28.6	14.4		24.7	14.1	26.7	19.6		31.7	28.2	
Level of Service		C	B		C	B	C	B		C	C	
Approach Delay (s)		22.5			21.9			20.2			28.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	9.3
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	101	1343	43	0	1136
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	110	1460	47	0	1235
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			530			475
pX, platoon unblocked	0.82	0.75			0.75	
vC, conflicting volume	2077	730			1507	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1170	0			1019	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	87			100	
cM capacity (veh/h)	152	818			510	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	730	730	47	617	617
Volume Left	0	0	0	0	0	0
Volume Right	110	0	0	47	0	0
cSH	818	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.43	0.43	0.03	0.36	0.36
Queue Length 95th (ft)	12	0	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	10.1	0.0			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	50.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	122	320	163	171	313	280	811	67	201	695	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1682		3433	3499		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1682		3433	3499		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	133	348	177	186	340	304	882	73	218	755	261
RTOR Reduction (vph)	0	0	43	0	61	0	0	6	0	0	0	151
Lane Group Flow (vph)	250	133	305	177	465	0	304	949	0	218	755	110
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	7	4	5	3	8		5	2		1	6	7
Permitted Phases			4									6
Actuated Green, G (s)	9.1	28.1	39.8	12.1	31.7		11.7	32.3		14.8	35.4	44.5
Effective Green, g (s)	9.1	28.1	39.8	12.1	31.7		11.7	32.3		14.8	35.4	44.5
Actuated g/C Ratio	0.09	0.27	0.38	0.11	0.30		0.11	0.31		0.14	0.34	0.42
Clearance Time (s)	4.0	4.6	4.0	4.0	4.0		4.0	5.5		4.0	5.5	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	296	497	598	203	506		381	1072		249	1189	668
v/s Ratio Prot	0.07	0.07	0.06	c0.10	c0.28		0.09	c0.27		c0.12	c0.21	0.01
v/s Ratio Perm			0.14									0.06
v/c Ratio	0.84	0.27	0.51	0.87	0.92		0.80	0.89		0.88	0.63	0.16
Uniform Delay, d1	47.5	30.5	25.3	45.9	35.6		45.7	34.8		44.4	29.5	18.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.3	0.3	0.7	31.1	21.7		11.1	9.0		27.1	1.1	0.1
Delay (s)	66.7	30.8	26.0	77.0	57.3		56.8	43.7		71.5	30.7	19.0
Level of Service	E	C	C	E	E		E	D		E	C	B
Approach Delay (s)		40.8			62.3			46.9			35.4	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	44.9	HCM Level of Service		D
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	105.4	Sum of lost time (s)		23.0
Intersection Capacity Utilization	85.0%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
21: Spectrum Center Boulevard & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	0	600	20	10	20	280	951	10	20	1086	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Lane Util. Factor	0.97		1.00		1.00	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00		0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433		1583		1803	1583	3433	3534		1770	3539	1583
Flt Permitted	0.95		1.00		0.97	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433		1583		1803	1583	3433	3534		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	0	652	22	11	22	304	1034	11	22	1180	98
RTOR Reduction (vph)	0	0	217	0	0	21	0	0	0	0	0	24
Lane Group Flow (vph)	207	0	435	0	33	1	304	1045	0	22	1180	74
Turn Type	Split		pm+ov	Split		Perm	Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4			3						6
Actuated Green, G (s)	10.0		20.1		4.3	4.3	10.1	46.8		1.5	38.2	38.2
Effective Green, g (s)	10.0		20.1		4.3	4.3	10.1	46.8		1.5	38.2	38.2
Actuated g/C Ratio	0.12		0.24		0.05	0.05	0.12	0.57		0.02	0.46	0.46
Clearance Time (s)	5.3		4.4		4.9	4.9	4.4	5.5		4.4	5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	415		385		94	82	419	2000		32	1635	731
v/s Ratio Prot	0.06		c0.14		c0.02		0.09	0.30		0.01	c0.33	
v/s Ratio Perm			0.14			0.00						0.05
v/c Ratio	0.50		1.13		0.35	0.01	0.73	0.52		0.69	0.72	0.10
Uniform Delay, d1	34.0		31.3		37.9	37.2	35.0	11.1		40.4	18.0	12.6
Progression Factor	1.00		1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9		85.8		2.3	0.1	6.1	0.2		47.1	1.6	0.1
Delay (s)	35.0		117.1		40.1	37.3	41.1	11.3		87.5	19.6	12.6
Level of Service	C		F		D	D	D	B		F	B	B
Approach Delay (s)		97.3			39.0			18.0			20.2	
Approach LOS		F			D			B			C	

Intersection Summary			
HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	19.2
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	970	180	120	790	352	520	593	390	770	705	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4966		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4966		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	235	1054	196	130	859	383	565	645	424	837	766	359
RTOR Reduction (vph)	0	18	0	0	0	56	0	0	132	0	0	145
Lane Group Flow (vph)	235	1232	0	130	859	327	565	645	292	837	766	214
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	20.1	43.1		12.3	35.5	64.6	22.2	33.8	33.8	29.1	40.8	40.8
Effective Green, g (s)	20.1	43.1		12.3	35.5	64.6	22.2	33.8	33.8	29.1	40.8	40.8
Actuated g/C Ratio	0.14	0.31		0.09	0.26	0.47	0.16	0.24	0.24	0.21	0.29	0.29
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	5.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	256	1542		157	1301	1297	549	862	385	720	1040	465
v/s Ratio Prot	c0.13	c0.25		0.07	0.17	0.05	0.16	0.18		c0.24	c0.22	
v/s Ratio Perm						0.06			0.18			0.14
v/c Ratio	0.92	0.80		0.83	0.66	0.25	1.03	0.75	0.76	1.16	0.74	0.46
Uniform Delay, d1	58.5	43.9		62.2	46.3	22.5	58.3	48.6	48.7	54.9	44.2	40.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.7	3.0		28.7	1.3	0.1	46.1	3.6	8.3	88.0	2.8	0.7
Delay (s)	93.2	46.9		90.9	47.5	22.6	104.4	52.2	57.0	142.8	46.9	40.7
Level of Service	F	D		F	D	C	F	D	E	F	D	D
Approach Delay (s)		54.2			44.7			71.5			86.7	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	66.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	138.8	Sum of lost time (s)	8.8
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	2020	40	50	862	254	50	20	600	541	40	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1	7.1	4.4	6.1	6.1		4.9	4.9	4.9	4.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	6408	1583		1799	1583	1770	1612	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.57	1.00	0.71	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	6408	1583		1058	1583	1318	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	2196	43	54	937	276	54	22	652	588	43	380
RTOR Reduction (vph)	0	0	15	0	0	166	0	0	47	0	69	0
Lane Group Flow (vph)	76	2196	28	54	937	110	0	76	605	588	354	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4		4	4		
Actuated Green, G (s)	5.5	56.3	56.3	3.6	55.4	55.4		62.7	62.7	62.7	62.7	
Effective Green, g (s)	5.5	56.3	56.3	3.6	55.4	55.4		62.7	62.7	62.7	62.7	
Actuated g/C Ratio	0.04	0.41	0.41	0.03	0.40	0.40		0.45	0.45	0.45	0.45	
Clearance Time (s)	4.4	7.1	7.1	4.4	6.1	6.1		4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	136	2060	641	89	2554	631		477	714	595	727	
v/s Ratio Prot	c0.02	c0.43		0.02	0.15						0.22	
v/s Ratio Perm			0.02			0.07		0.07	0.38	c0.45		
v/c Ratio	0.56	1.07	0.04	0.61	0.37	0.17		0.16	0.85	0.99	0.49	
Uniform Delay, d1	65.6	41.4	25.0	67.0	29.4	27.0		22.6	33.9	37.8	26.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.9	40.1	0.0	11.2	0.1	0.1		0.2	9.2	33.5	0.5	
Delay (s)	70.5	81.5	25.1	78.2	29.5	27.1		22.7	43.1	71.3	27.3	
Level of Service	E	F	C	E	C	C		C	D	E	C	
Approach Delay (s)		80.1			31.1			40.9			52.9	
Approach LOS		F			C			D			D	

Intersection Summary				
HCM Average Control Delay	57.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	9.3	
Intersection Capacity Utilization	120.2%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
24: Ruffin Court & Driveway #3

2035 + Proj PM
1/3/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	81	316	348	27	63	189
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	343	378	29	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	408				912	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	408				912	393
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				76	69
cM capacity (veh/h)	1151				281	656

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	88	343	408	274
Volume Left	88	0	0	68
Volume Right	0	0	29	205
cSH	1151	1700	1700	492
Volume to Capacity	0.08	0.20	0.24	0.56
Queue Length 95th (ft)	6	0	0	84
Control Delay (s)	8.4	0.0	0.0	21.2
Lane LOS	A			C
Approach Delay (s)	1.7		0.0	21.2
Approach LOS				C

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	363	337	16	38	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	395	366	17	41	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	384				804	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384				804	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	94
cM capacity (veh/h)	1175				347	671

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	395	384	83
Volume Left	17	0	0	41
Volume Right	0	0	17	41
cSH	1175	1700	1700	457
Volume to Capacity	0.01	0.23	0.23	0.18
Queue Length 95th (ft)	1	0	0	16
Control Delay (s)	8.1	0.0	0.0	14.6
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	14.6
Approach LOS				B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

ILV ANALYSIS WORKSHEETS

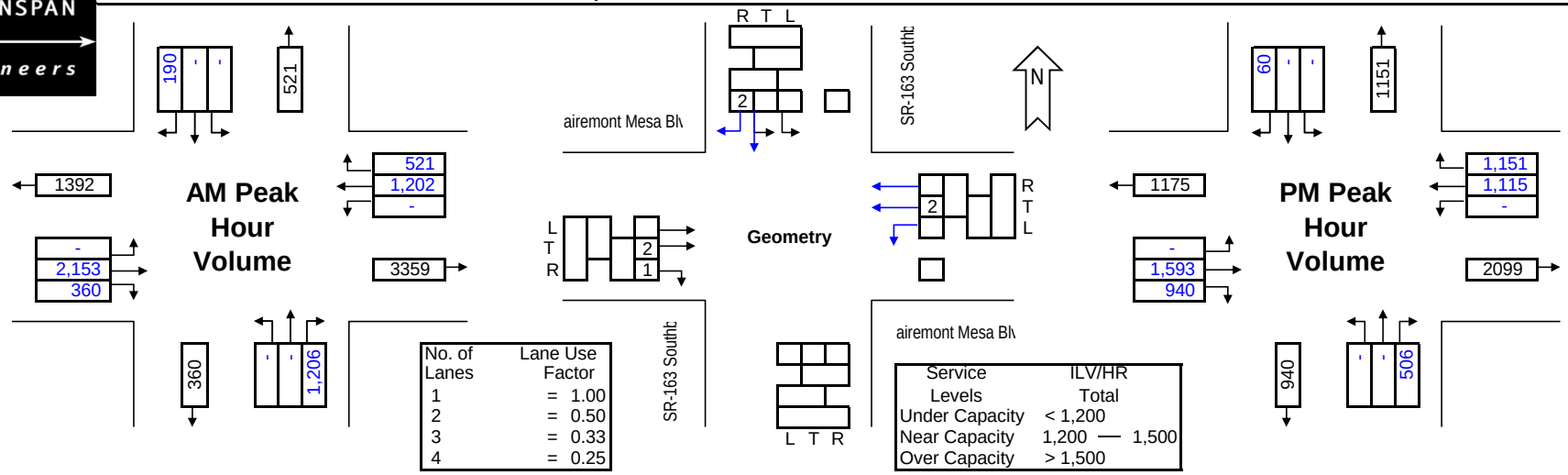
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035 + Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Southbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



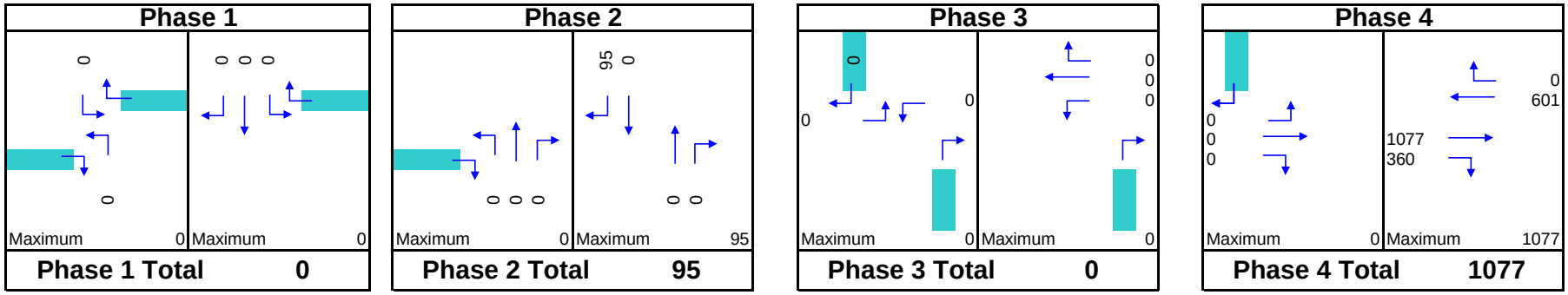
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1172

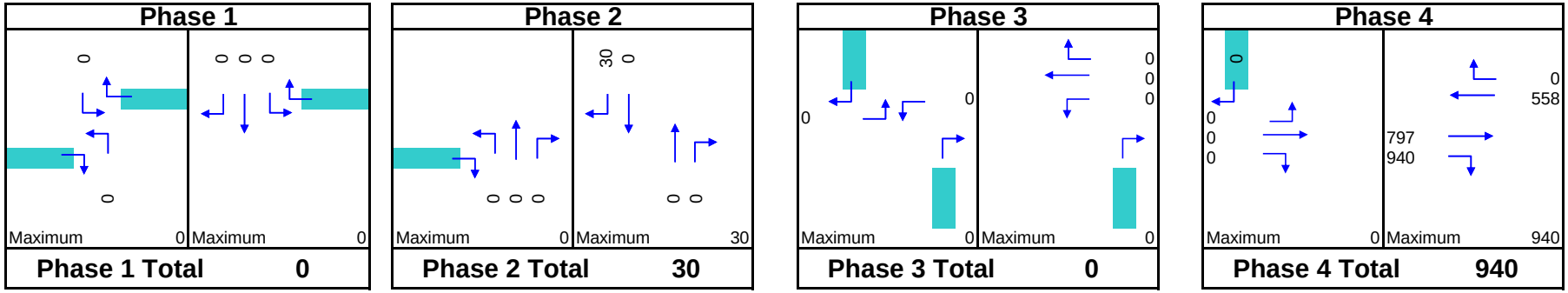
Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 970

Service Level: **Under Capacity**



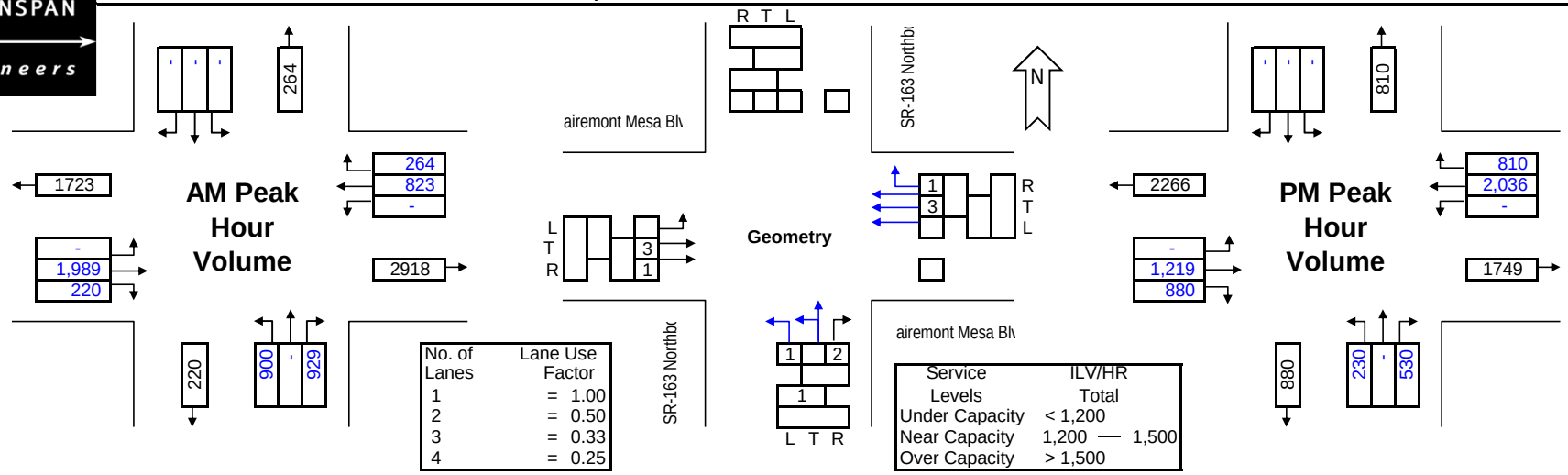
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035 + Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-163 Northbound Ramps at Clairemont Mesa Blvd.
N/S
E/W



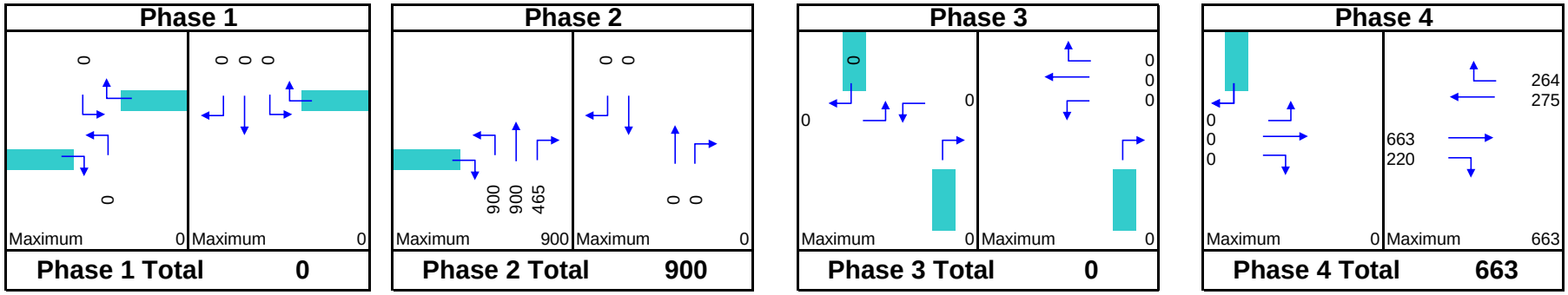
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1563

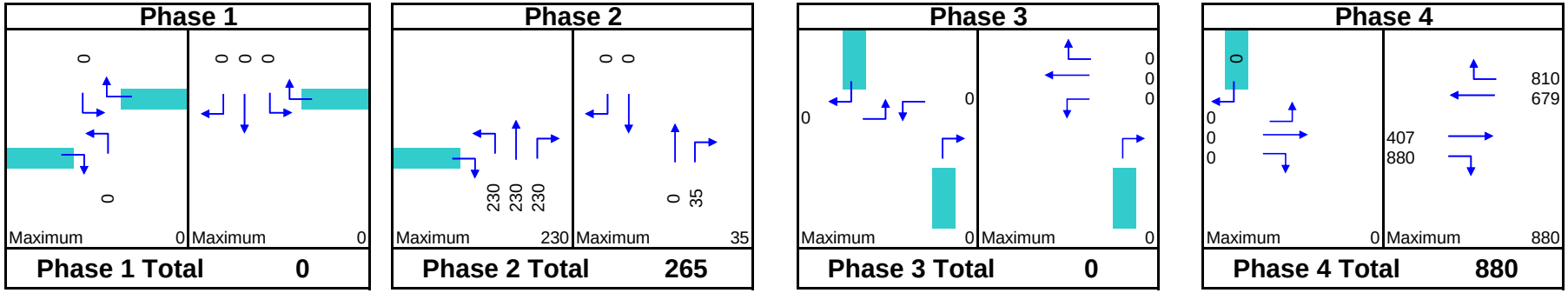
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1145

Service Level: **Under Capacity**



LINSCOTT LAW & GREENSPAN engineers

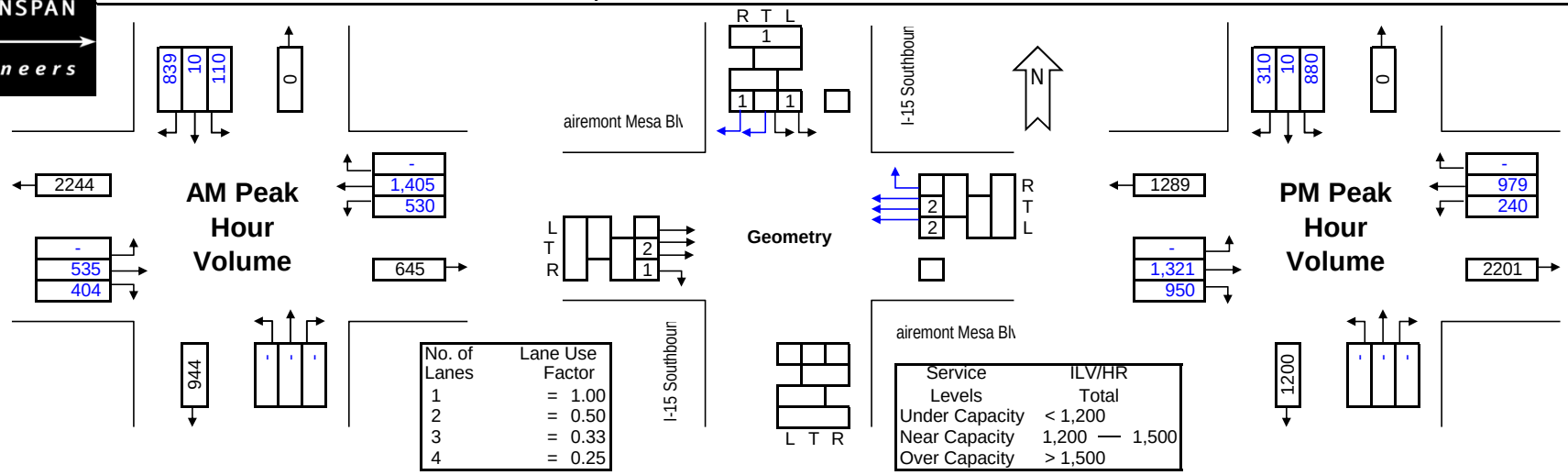
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035 + Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Southbound Ramps at Clairemont Mesa Blvd.

N/S
E/W

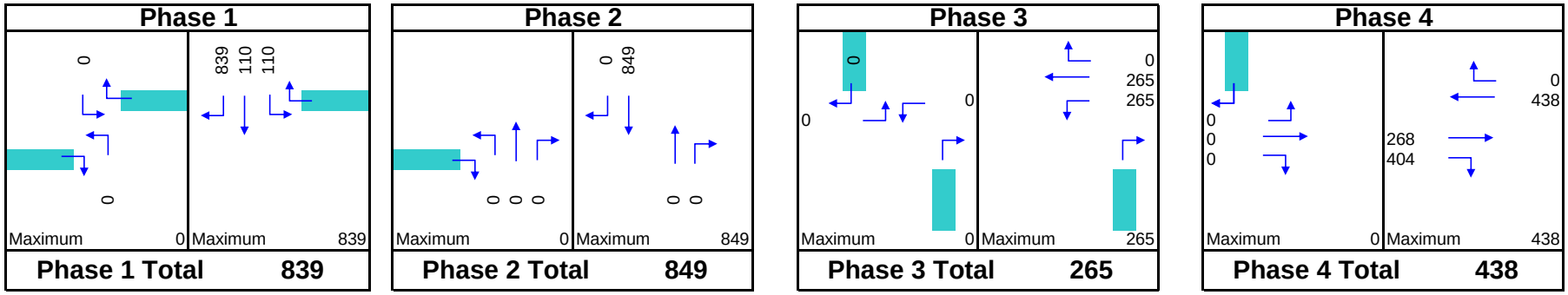


No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

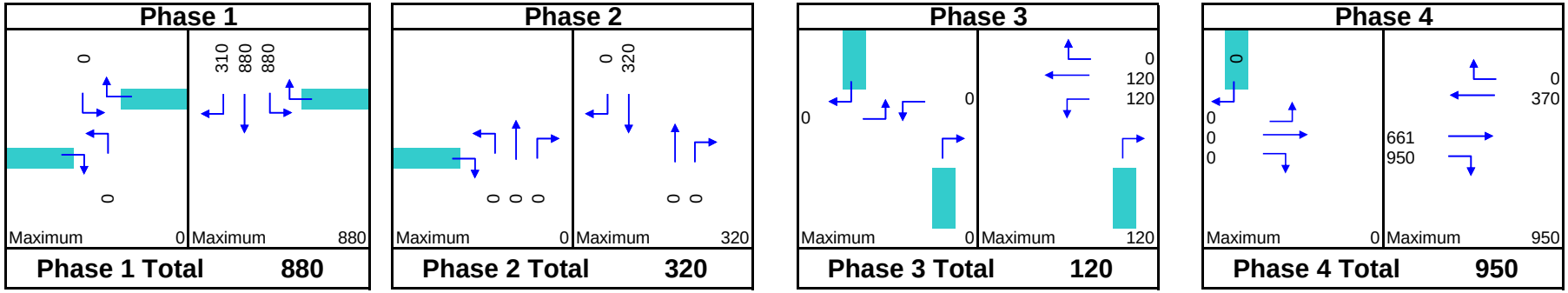
AM Peak Hour Analysis

Total Crictical Lane Volume 2391 — Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 2270 — Service Level: **Over Capacity**



LINSCOTT LAW & GREENSPAN engineers

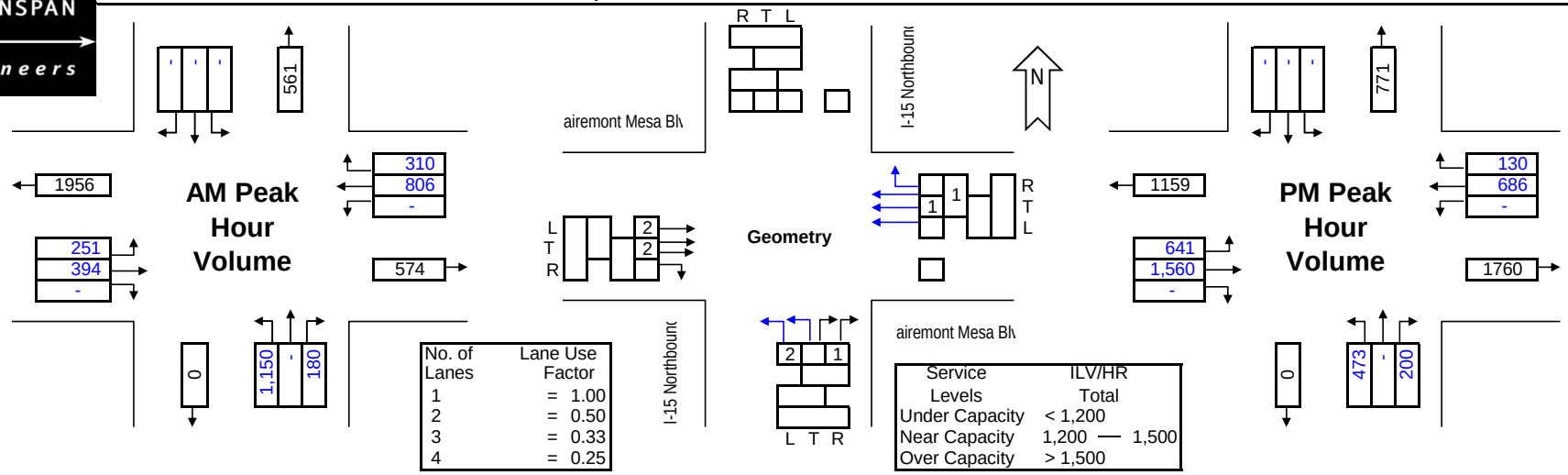
SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035 + Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: I-15 Northbound Ramps at Clairemont Mesa Blvd.

N/S
E/W



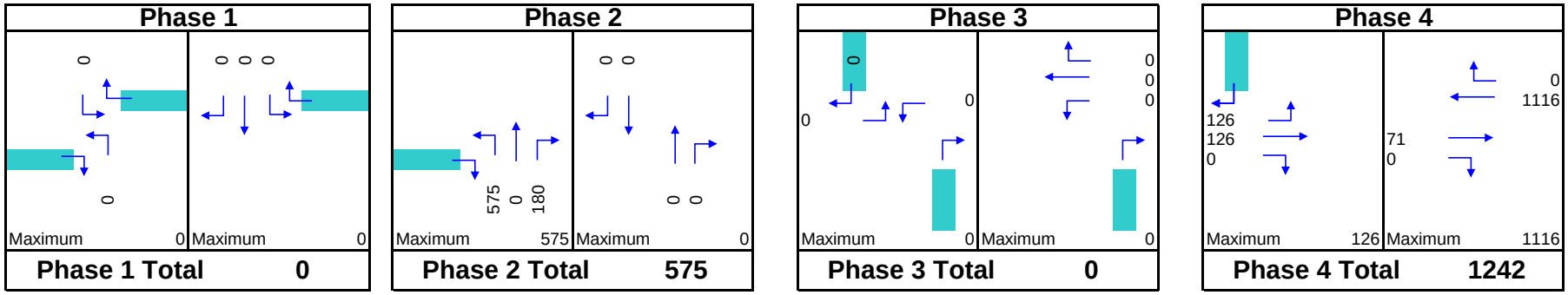
No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1817

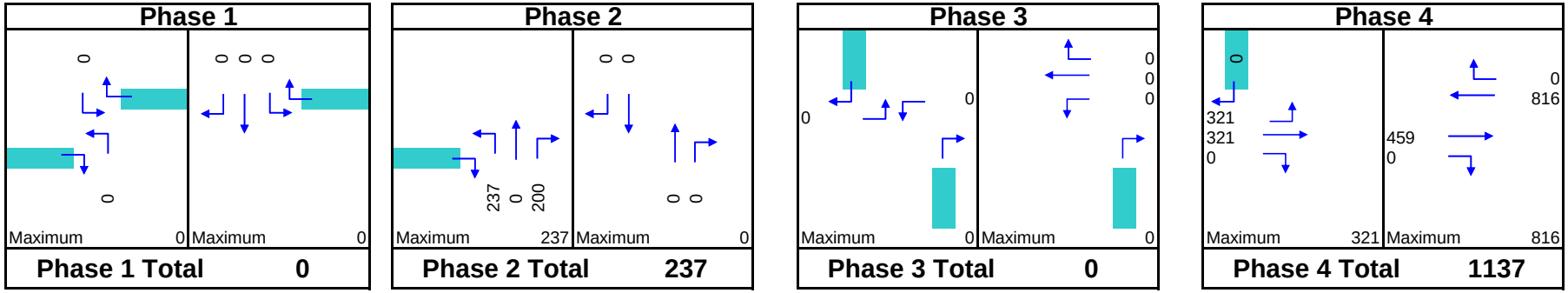
Service Level: **Over Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1374

Service Level: **Near Capacity**



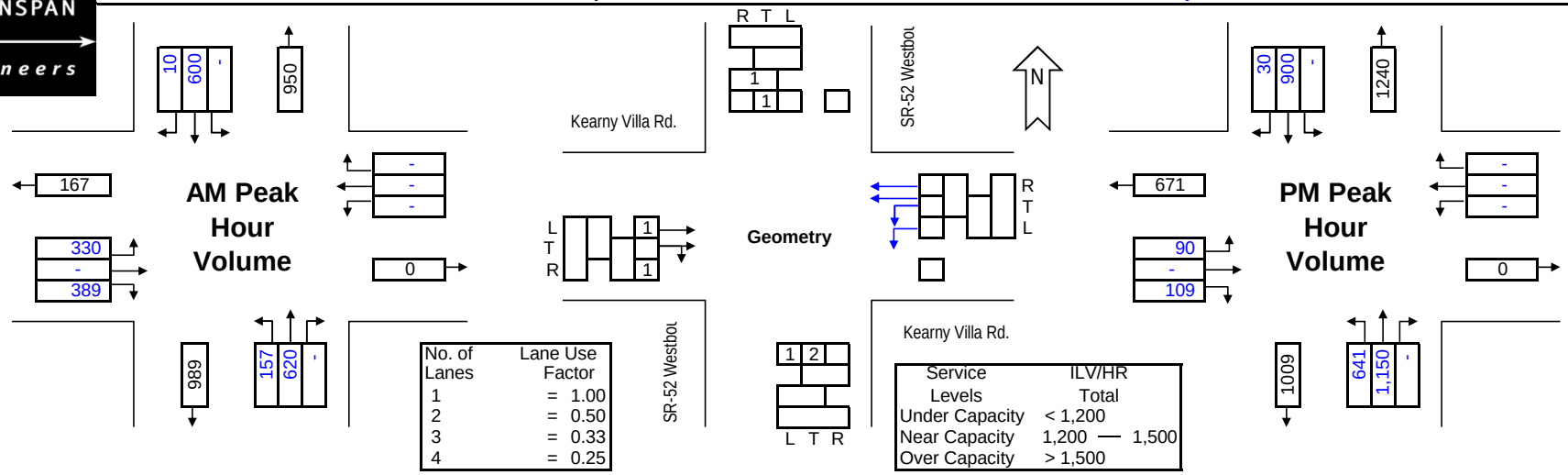
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035 + Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-12-2093

LOCATION: SR-52 Westbound Ramps N/S
at Kearny Villa Rd. E/W

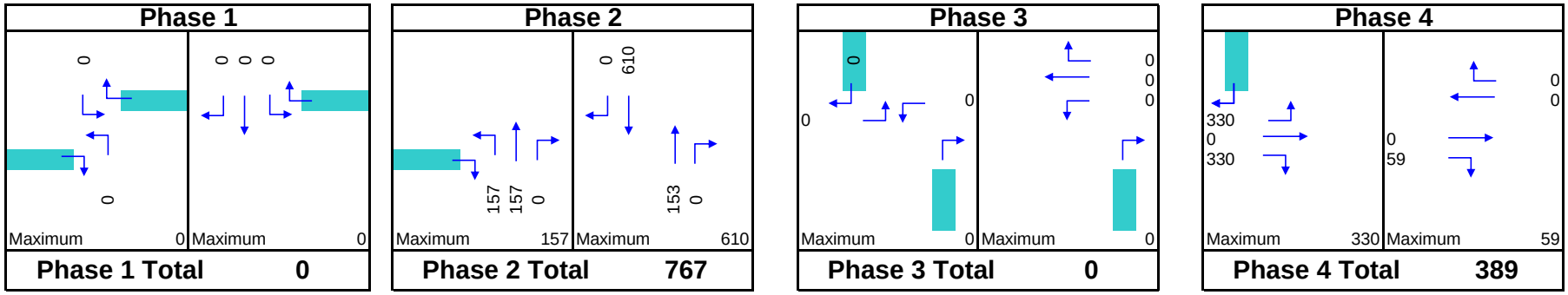


No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

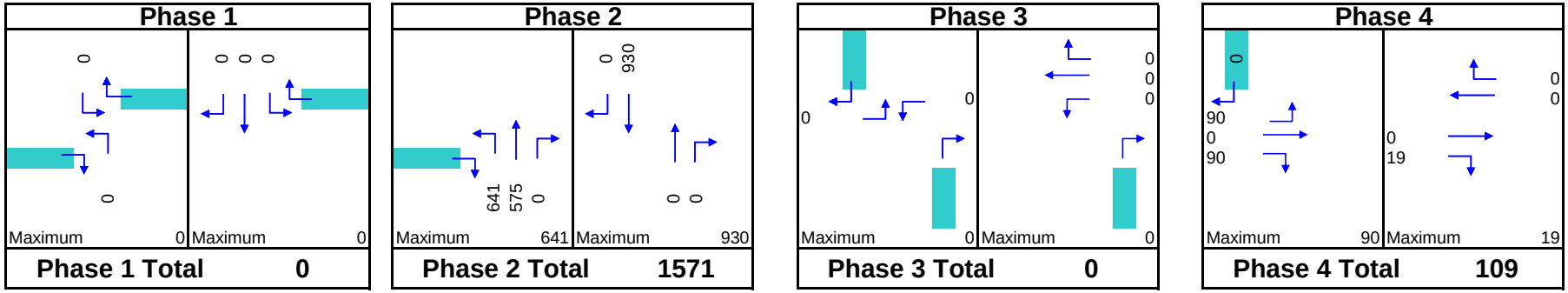
AM Peak Hour Analysis

Total Crictical Lane Volume 1156 — Service Level: **Under Capacity**



PM Peak Hour Analysis

Total Crictical Lane Volume 1680 — Service Level: **Over Capacity**



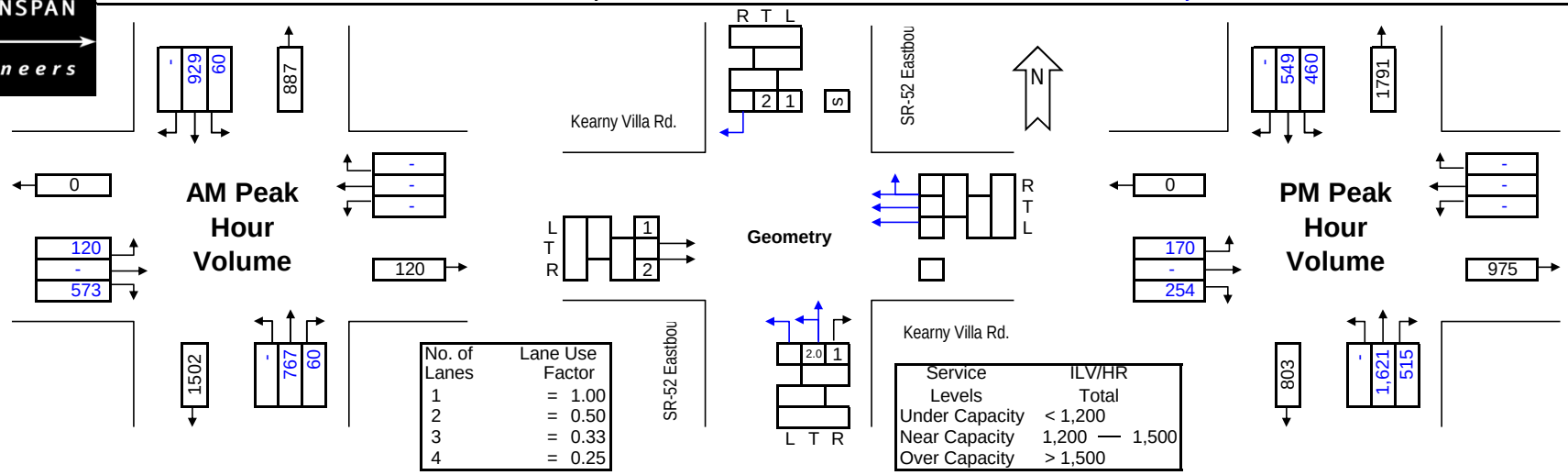
LINSCOTT LAW & GREENSPAN engineers

SIGNALIZED INTERSECTION LANE VOLUME CAPACITY ANALYSIS

CONDITION: Year 2035 + Project
COMPUTED BY: JN

DATE: 2/21/2013
Project Number 3-08-1869

LOCATION: SR-52 Eastbound Ramps N/S
at Kearny Villa Rd. E/W



No. of Lanes	Lane Use Factor
1	= 1.00
2	= 0.50
3	= 0.33
4	= 0.25

Service Levels	ILV/HR Total
Under Capacity	< 1,200
Near Capacity	1,200 — 1,500
Over Capacity	> 1,500

AM Peak Hour Analysis

Total Crictical Lane Volume 1136 — Service Level: **Under Capacity**

Phase	Maximum	Total
Phase 1	0 / 60	60
Phase 2	384 / 405	789
Phase 3	0 / 0	0
Phase 4	120 / 167	287

PM Peak Hour Analysis

Total Crictical Lane Volume 1441 — Service Level: **Near Capacity**

Phase	Maximum	Total
Phase 1	0 / 460	460
Phase 2	811 / 0	811
Phase 3	0 / 0	0
Phase 4	170 / 0	170

Table X
Year 2035 + Project ILV Operations

Intersection	Peak Hour	Results	
		ILV/Hour	Capacity
2. Clairemont Mesa Blvd./SR-163 Southbound Ramps	AM	1,172	Under Capacity
	PM	970	Under Capacity
3. Clairemont Mesa Blvd./SR-163 Northbound Ramps	AM	1,563	Over Capacity
	PM	1,145	Under Capacity
10. Clairemont Mesa Blvd./I-15 Southbound Ramps	AM	2,391	Over Capacity
	PM	2,270	Over Capacity
11. Clairemont Mesa Blvd./I-15 Northbound Ramps	AM	1,817	Over Capacity
	PM	1,374	Near Capacity
13. Ruffin Rd./SR-52 Westbound Ramps	AM	1,156	Under Capacity
	PM	1,680	Over Capacity
14. Ruffin Rd./SR-52 Eastbound Ramps	AM	1,136	Under Capacity
	PM	1,441	Near Capacity

ARTERIAL ANALYSIS – VIEW RIDGE AVENUE

Arterial Level of Service: WB Ruffin Court

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ruffin Road	III	30	100.3	36.5	136.8	0.84	22.0	C
Total	III		100.3	36.5	136.8	0.84	22.0	C

Arterial Level of Service: SB Viewridge Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Balboa Avenue	III	30	100.3	62.1	162.4	0.84	18.5	C
Total	III		100.3	62.1	162.4	0.84	18.5	C

Arterial Level of Service: WB Ruffin Court

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Ruffin Road	III	30	100.3	54.3	154.6	0.84	19.5	C
Total	III		100.3	54.3	154.6	0.84	19.5	C

Arterial Level of Service: SB Viewridge Avenue

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Balboa Avenue	III	30	100.3	21.5	121.8	0.84	24.7	B
Total	III		100.3	21.5	121.8	0.84	24.7	B

APPENDIX L

QUEUING ANALYSIS WORKSHEETS AND COMMUNITY PLAN LAND USE DESIGNATION

APPENDIX L-1

QUEUING ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	667	70	349	1310	26	130
v/c Ratio	0.22	0.06	0.47	0.30	0.23	0.13
Control Delay	7.5	0.1	38.8	1.9	52.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	0.1	38.8	1.9	52.8	4.8
Queue Length 50th (ft)	88	0	112	45	18	0
Queue Length 95th (ft)	m111	m0	159	65	46	22
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)		150	250			
Base Capacity (vph)	3016	1137	737	4315	525	979
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.06	0.47	0.30	0.05	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	614	64	321	1205	24	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	667	70	349	1310	26	130
RTOR Reduction (vph)	0	24	0	0	0	94
Lane Group Flow (vph)	667	46	349	1310	26	36
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	65.2	72.4	23.6	93.3	7.2	30.8
Effective Green, g (s)	65.2	72.4	23.6	93.3	7.2	30.8
Actuated g/C Ratio	0.59	0.66	0.21	0.85	0.07	0.28
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3014	1105	737	4313	116	892
v/s Ratio Prot	0.13	0.00	c0.10	c0.26	c0.01	0.01
v/s Ratio Perm		0.03				0.00
v/c Ratio	0.22	0.04	0.47	0.30	0.22	0.04
Uniform Delay, d1	10.5	6.6	37.8	1.7	48.8	28.8
Progression Factor	0.69	0.04	0.96	0.96	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.5	0.2	1.0	0.0
Delay (s)	7.4	0.3	36.9	1.8	49.7	28.9
Level of Service	A	A	D	A	D	C
Approach Delay (s)	6.7			9.2	32.3	
Approach LOS	A			A	C	

Intersection Summary

HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	88	227	92	29	11	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	247	100	32	12	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	132				554	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132				554	116
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				97	96
cM capacity (veh/h)	1454				461	937

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	96	247	132	48
Volume Left	96	0	0	12
Volume Right	0	0	32	36
cSH	1454	1700	1700	745
Volume to Capacity	0.07	0.15	0.08	0.06
Queue Length 95th (ft)	5	0	0	5
Control Delay (s)	7.7	0.0	0.0	10.2
Lane LOS	A			B
Approach Delay (s)	2.1		0.0	10.2
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	220	114	18	7	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	239	124	20	8	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	143				412	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	143				412	134
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1439				588	915

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	20	239	143	15
Volume Left	20	0	0	8
Volume Right	0	0	20	8
cSH	1439	1700	1700	716
Volume to Capacity	0.01	0.14	0.08	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	7.5	0.0	0.0	10.1
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	10.1
Approach LOS				B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1578	37	183	734	85	425
v/c Ratio	0.44	0.03	0.55	0.17	0.55	0.67
Control Delay	2.0	0.0	67.7	1.9	71.4	49.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	0.0	67.7	1.9	71.4	49.5
Queue Length 50th (ft)	28	0	81	28	73	182
Queue Length 95th (ft)	57	m0	118	44	125	226
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	3616	1557	424	4281	441	703
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.02	0.43	0.17	0.19	0.60

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1452	34	168	675	78	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1578	37	183	734	85	425
RTOR Reduction (vph)	0	7	0	0	0	26
Lane Group Flow (vph)	1578	30	183	734	85	399
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	96.0	107.8	13.2	113.7	11.8	25.0
Effective Green, g (s)	96.0	107.8	13.2	113.7	11.8	25.0
Actuated g/C Ratio	0.71	0.80	0.10	0.84	0.09	0.19
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3616	1264	336	4283	155	607
v/s Ratio Prot	c0.31	0.00	0.05	0.14	0.05	c0.06
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.44	0.02	0.54	0.17	0.55	0.66
Uniform Delay, d1	8.2	2.8	58.0	2.0	59.0	51.0
Progression Factor	0.20	0.00	1.06	0.84	1.00	1.00
Incremental Delay, d2	0.3	0.0	1.8	0.1	3.9	2.6
Delay (s)	1.9	0.0	63.5	1.7	63.0	53.6
Level of Service	A	A	E	A	E	D
Approach Delay (s)	1.9			14.1	55.2	
Approach LOS	A			B	E	

Intersection Summary

HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	46	116	210	15	36	107
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	126	228	16	39	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	245				462	236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	245				462	236
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				93	86
cM capacity (veh/h)	1322				536	803

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	50	126	245	155
Volume Left	50	0	0	39
Volume Right	0	0	16	116
cSH	1322	1700	1700	1073
Volume to Capacity	0.04	0.07	0.14	0.14
Queue Length 95th (ft)	3	0	0	13
Control Delay (s)	7.8	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	2.2		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	143	204	9	21	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	155	222	10	23	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	232				402	227
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	232				402	227
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	1336				600	813

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	10	155	232	46
Volume Left	10	0	0	23
Volume Right	0	0	10	23
cSH	1336	1700	1700	690
Volume to Capacity	0.01	0.09	0.14	0.07
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	7.7	0.0	0.0	10.6
Lane LOS	A			B
Approach Delay (s)	0.5		0.0	10.6
Approach LOS				B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	671	120	490	1318	42	171
v/c Ratio	0.22	0.10	0.74	0.31	0.32	0.18
Control Delay	13.3	6.8	50.5	1.8	54.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	6.8	50.5	1.8	54.1	7.3
Queue Length 50th (ft)	87	9	165	46	29	10
Queue Length 95th (ft)	m110	m16	187	54	63	34
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	3085	1501	830	4271	525	1076
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.08	0.59	0.31	0.08	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	617	110	451	1213	39	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	671	120	490	1318	42	171
RTOR Reduction (vph)	0	23	0	0	0	98
Lane Group Flow (vph)	671	97	490	1318	42	73
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	66.7	74.8	21.2	92.4	8.1	29.3
Effective Green, g (s)	66.7	74.8	21.2	92.4	8.1	29.3
Actuated g/C Ratio	0.61	0.68	0.19	0.84	0.07	0.27
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3083	1076	662	4271	130	854
v/s Ratio Prot	0.13	0.01	c0.14	c0.26	c0.02	0.02
v/s Ratio Perm		0.05				0.01
v/c Ratio	0.22	0.09	0.74	0.31	0.32	0.09
Uniform Delay, d1	9.8	6.0	41.8	1.9	48.3	30.3
Progression Factor	1.24	2.78	1.05	0.83	1.00	1.00
Incremental Delay, d2	0.1	0.0	4.3	0.2	1.4	0.0
Delay (s)	12.3	16.7	48.1	1.8	49.8	30.3
Level of Service	B	B	D	A	D	C
Approach Delay (s)	13.0			14.3	34.2	
Approach LOS	B			B	C	

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	150	239	96	50	18	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	260	104	54	20	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	159				717	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159				717	132
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				94	94
cM capacity (veh/h)	1421				351	918

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	260	159	77
Volume Left	163	0	0	20
Volume Right	0	0	54	58
cSH	1421	1700	1700	651
Volume to Capacity	0.11	0.15	0.09	0.12
Queue Length 95th (ft)	10	0	0	10
Control Delay (s)	7.9	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	3.0		0.0	11.3
Approach LOS				B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	30.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	30	227	135	30	11	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	247	147	33	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	179				475	163
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	179				475	163
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	99
cM capacity (veh/h)	1396				536	882

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	247	179	24
Volume Left	33	0	0	12
Volume Right	0	0	33	12
cSH	1396	1700	1700	666
Volume to Capacity	0.02	0.15	0.11	0.04
Queue Length 95th (ft)	2	0	0	3
Control Delay (s)	7.6	0.0	0.0	10.6
Lane LOS	A			B
Approach Delay (s)	0.9		0.0	10.6
Approach LOS				B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	25.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1590	64	323	739	151	753
v/c Ratio	0.54	0.05	0.48	0.18	0.68	0.76
Control Delay	19.7	0.1	58.4	2.9	71.4	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	0.1	58.4	2.9	71.4	42.4
Queue Length 50th (ft)	205	0	134	38	129	322
Queue Length 95th (ft)	245	m1	186	61	195	362
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	2924	1374	698	4091	441	1016
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.05	0.46	0.18	0.34	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1463	59	297	680	139	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1590	64	323	739	151	753
RTOR Reduction (vph)	0	19	0	0	0	10
Lane Group Flow (vph)	1590	45	323	739	151	743
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	77.6	94.5	26.5	108.6	16.9	43.4
Effective Green, g (s)	77.6	94.5	26.5	108.6	16.9	43.4
Actuated g/C Ratio	0.57	0.70	0.20	0.80	0.13	0.32
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2923	1108	674	4091	222	987
v/s Ratio Prot	c0.31	0.01	0.09	0.15	0.09	c0.15
v/s Ratio Perm		0.02				0.12
v/c Ratio	0.54	0.04	0.48	0.18	0.68	0.75
Uniform Delay, d1	17.8	6.3	48.1	3.0	56.5	41.0
Progression Factor	1.02	0.03	1.17	0.86	1.00	1.00
Incremental Delay, d2	0.6	0.0	0.5	0.1	8.3	3.3
Delay (s)	18.6	0.2	56.8	2.7	64.7	44.3
Level of Service	B	A	E	A	E	D
Approach Delay (s)	17.9			19.1	47.7	
Approach LOS	B			B	D	

Intersection Summary

HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	81	123	227	27	63	189
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	134	247	29	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	276				571	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	276				571	261
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				85	74
cM capacity (veh/h)	1287				449	777

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	88	134	276	274
Volume Left	88	0	0	68
Volume Right	0	0	29	205
cSH	1287	1700	1700	657
Volume to Capacity	0.07	0.08	0.16	0.42
Queue Length 95th (ft)	6	0	0	51
Control Delay (s)	8.0	0.0	0.0	14.3
Lane LOS	A			B
Approach Delay (s)	3.2		0.0	14.3
Approach LOS				B

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	170	216	16	38	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	185	235	17	41	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	252				463	243
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	252				463	243
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	95
cM capacity (veh/h)	1313				550	795

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	185	252	83
Volume Left	17	0	0	41
Volume Right	0	0	17	41
cSH	1313	1700	1700	650
Volume to Capacity	0.01	0.11	0.15	0.13
Queue Length 95th (ft)	1	0	0	11
Control Delay (s)	7.8	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	0.7		0.0	11.3
Approach LOS				B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	697	70	349	1622	26	130
v/c Ratio	0.21	0.06	0.68	0.38	0.23	0.16
Control Delay	14.2	4.6	60.7	1.6	52.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	4.6	60.7	1.6	52.8	5.4
Queue Length 50th (ft)	103	1	128	41	18	0
Queue Length 95th (ft)	m126	m5	177	53	46	23
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	3348	1560	737	4315	525	979
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.04	0.47	0.38	0.05	0.13

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	641	64	321	1492	24	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	697	70	349	1622	26	130
RTOR Reduction (vph)	0	19	0	0	0	102
Lane Group Flow (vph)	697	51	349	1622	26	28
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	72.4	79.6	16.4	93.3	7.2	23.6
Effective Green, g (s)	72.4	79.6	16.4	93.3	7.2	23.6
Actuated g/C Ratio	0.66	0.72	0.15	0.85	0.07	0.21
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3347	1146	512	4313	116	709
v/s Ratio Prot	0.14	0.00	c0.10	c0.32	c0.01	0.01
v/s Ratio Perm		0.03				0.00
v/c Ratio	0.21	0.04	0.68	0.38	0.22	0.04
Uniform Delay, d1	7.4	4.3	44.3	1.9	48.8	34.2
Progression Factor	1.77	4.72	1.22	0.70	1.00	1.00
Incremental Delay, d2	0.1	0.0	3.6	0.2	1.0	0.0
Delay (s)	13.3	20.5	57.9	1.6	49.7	34.2
Level of Service	B	C	E	A	D	C
Approach Delay (s)	14.0			11.5	36.8	
Approach LOS	B			B	D	

Intersection Summary

HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	88	283	199	29	11	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	308	216	32	12	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	248				731	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	248				731	232
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				97	96
cM capacity (veh/h)	1318				361	807

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	96	308	248	48
Volume Left	96	0	0	12
Volume Right	0	0	32	36
cSH	1318	1700	1700	616
Volume to Capacity	0.07	0.18	0.15	0.08
Queue Length 95th (ft)	6	0	0	6
Control Delay (s)	7.9	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	1.9		0.0	11.3
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	222	129	18	7	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	241	140	20	8	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	160				430	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				430	150
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1419				574	896

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	20	241	160	15
Volume Left	20	0	0	8
Volume Right	0	0	20	8
cSH	1419	1700	1700	700
Volume to Capacity	0.01	0.14	0.09	0.02
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	7.6	0.0	0.0	10.3
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	10.3
Approach LOS				B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1875	37	183	889	85	425
v/c Ratio	0.52	0.03	0.53	0.21	0.54	0.68
Control Delay	4.6	0.0	68.4	1.8	71.3	51.7
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	0.0	68.4	1.8	71.3	51.7
Queue Length 50th (ft)	72	0	78	34	73	190
Queue Length 95th (ft)	143	m0	113	46	125	234
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	3595	1570	383	4280	480	657
Starvation Cap Reductn	466	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.02	0.48	0.21	0.18	0.65

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1725	34	168	818	78	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1875	37	183	889	85	425
RTOR Reduction (vph)	0	8	0	0	0	11
Lane Group Flow (vph)	1875	29	183	889	85	414
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	95.4	107.3	13.7	113.6	11.9	25.6
Effective Green, g (s)	95.4	107.3	13.7	113.6	11.9	25.6
Actuated g/C Ratio	0.71	0.79	0.10	0.84	0.09	0.19
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3593	1258	348	4279	156	619
v/s Ratio Prot	c0.37	0.00	0.05	0.17	0.05	c0.07
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.52	0.02	0.53	0.21	0.54	0.67
Uniform Delay, d1	9.2	2.9	57.6	2.1	59.0	50.8
Progression Factor	0.43	0.02	1.10	0.77	1.00	1.00
Incremental Delay, d2	0.4	0.0	1.4	0.1	3.9	2.8
Delay (s)	4.3	0.1	64.5	1.7	62.8	53.5
Level of Service	A	A	E	A	E	D
Approach Delay (s)	4.2			12.4	55.1	
Approach LOS	A			B	E	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	46	174	246	15	36	107
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	189	267	16	39	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	284				565	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				565	276
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				92	85
cM capacity (veh/h)	1279				467	763

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	50	189	284	155
Volume Left	50	0	0	39
Volume Right	0	0	16	116
cSH	1279	1700	1700	658
Volume to Capacity	0.04	0.11	0.17	0.24
Queue Length 95th (ft)	3	0	0	23
Control Delay (s)	7.9	0.0	0.0	12.2
Lane LOS	A			B
Approach Delay (s)	1.7		0.0	12.2
Approach LOS				B

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	159	210	9	21	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	173	228	10	23	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	238				426	233
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	238				426	233
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	1329				581	806

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	10	173	238	46
Volume Left	10	0	0	23
Volume Right	0	0	10	23
cSH	1329	1700	1700	675
Volume to Capacity	0.01	0.10	0.14	0.07
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	7.7	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	0.4		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	700	120	490	1630	42	171
v/c Ratio	0.23	0.10	0.74	0.38	0.32	0.18
Control Delay	14.0	5.6	60.2	1.9	54.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	5.6	60.2	1.9	54.1	9.3
Queue Length 50th (ft)	86	6	184	55	29	15
Queue Length 95th (ft)	m110	m0	238	64	63	38
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	3085	1501	830	4271	525	1066
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.08	0.59	0.38	0.08	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	644	110	451	1500	39	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	700	120	490	1630	42	171
RTOR Reduction (vph)	0	23	0	0	0	86
Lane Group Flow (vph)	700	97	490	1630	42	85
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	66.7	74.8	21.2	92.4	8.1	29.3
Effective Green, g (s)	66.7	74.8	21.2	92.4	8.1	29.3
Actuated g/C Ratio	0.61	0.68	0.19	0.84	0.07	0.27
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3083	1076	662	4271	130	854
v/s Ratio Prot	0.14	0.01	c0.14	c0.32	c0.02	0.02
v/s Ratio Perm		0.05				0.01
v/c Ratio	0.23	0.09	0.74	0.38	0.32	0.10
Uniform Delay, d1	9.9	6.0	41.8	2.1	48.3	30.4
Progression Factor	1.30	2.25	1.28	0.75	1.00	1.00
Incremental Delay, d2	0.2	0.0	4.3	0.2	1.4	0.1
Delay (s)	13.0	13.5	58.0	1.8	49.8	30.5
Level of Service	B	B	E	A	D	C
Approach Delay (s)	13.1			14.8	34.3	
Approach LOS	B			B	C	

Intersection Summary

HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	150	295	203	50	18	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	321	221	54	20	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	275				895	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275				895	248
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				93	93
cM capacity (veh/h)	1288				272	791

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	321	275	77
Volume Left	163	0	0	20
Volume Right	0	0	54	58
cSH	1288	1700	1700	533
Volume to Capacity	0.13	0.19	0.16	0.14
Queue Length 95th (ft)	11	0	0	13
Control Delay (s)	8.2	0.0	0.0	12.9
Lane LOS	A			B
Approach Delay (s)	2.8		0.0	12.9
Approach LOS				B

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	30	229	150	30	11	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	249	163	33	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	196				493	179
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	196				493	179
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	99
cM capacity (veh/h)	1377				522	863

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	249	196	24
Volume Left	33	0	0	12
Volume Right	0	0	33	12
cSH	1377	1700	1700	651
Volume to Capacity	0.02	0.15	0.12	0.04
Queue Length 95th (ft)	2	0	0	3
Control Delay (s)	7.7	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	0.9		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1887	64	323	895	151	753
v/c Ratio	0.65	0.05	0.47	0.22	0.67	0.75
Control Delay	25.1	2.1	54.7	3.0	70.1	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	2.1	54.7	3.0	70.1	42.2
Queue Length 50th (ft)	338	3	133	47	128	325
Queue Length 95th (ft)	m389	m3	185	73	193	367
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	2882	1583	694	4080	818	1009
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.04	0.47	0.22	0.18	0.75

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1736	59	297	823	139	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1887	64	323	895	151	753
RTOR Reduction (vph)	0	20	0	0	0	0
Lane Group Flow (vph)	1887	44	323	895	151	753
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	76.5	93.7	27.3	108.3	17.2	44.5
Effective Green, g (s)	76.5	93.7	27.3	108.3	17.2	44.5
Actuated g/C Ratio	0.57	0.69	0.20	0.80	0.13	0.33
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2882	1099	694	4079	226	1010
v/s Ratio Prot	c0.37	0.01	0.09	0.18	0.09	c0.15
v/s Ratio Perm		0.02				0.12
v/c Ratio	0.65	0.04	0.47	0.22	0.67	0.75
Uniform Delay, d1	20.2	6.5	47.4	3.2	56.2	40.2
Progression Factor	1.15	1.57	1.11	0.83	1.00	1.00
Incremental Delay, d2	0.8	0.0	0.5	0.1	7.3	3.0
Delay (s)	23.8	10.2	53.0	2.8	63.5	43.2
Level of Service	C	B	D	A	E	D
Approach Delay (s)	23.4			16.1	46.6	
Approach LOS	C			B	D	

Intersection Summary

HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	81	181	263	27	63	189
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	197	286	29	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	315				673	301
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315				673	301
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				82	72
cM capacity (veh/h)	1245				391	739

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	88	197	315	274
Volume Left	88	0	0	68
Volume Right	0	0	29	205
cSH	1245	1700	1700	604
Volume to Capacity	0.07	0.12	0.19	0.45
Queue Length 95th (ft)	6	0	0	59
Control Delay (s)	8.1	0.0	0.0	15.8
Lane LOS	A			C
Approach Delay (s)	2.5		0.0	15.8
Approach LOS				C

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	186	222	16	38	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	202	241	17	41	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	259				487	250
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	259				487	250
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	95
cM capacity (veh/h)	1306				532	789

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	202	259	83
Volume Left	17	0	0	41
Volume Right	0	0	17	41
cSH	1306	1700	1700	636
Volume to Capacity	0.01	0.12	0.15	0.13
Queue Length 95th (ft)	1	0	0	11
Control Delay (s)	7.8	0.0	0.0	11.5
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	11.5
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	964	120	490	1777	42	171
v/c Ratio	0.29	0.10	0.77	0.40	0.37	0.21
Control Delay	14.9	1.8	65.3	1.9	69.0	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	1.8	65.3	1.9	69.0	24.6
Queue Length 50th (ft)	125	0	224	72	36	44
Queue Length 95th (ft)	160	m4	m255	m98	74	70
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	3291	1486	982	4403	441	1098
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.08	0.50	0.40	0.10	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	887	110	451	1635	39	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	964	120	490	1777	42	171
RTOR Reduction (vph)	0	33	0	0	0	39
Lane Group Flow (vph)	964	87	490	1777	42	132
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	87.4	96.0	25.0	116.9	8.6	33.6
Effective Green, g (s)	87.4	96.0	25.0	116.9	8.6	33.6
Actuated g/C Ratio	0.65	0.71	0.19	0.87	0.06	0.25
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3292	1126	636	4403	113	784
v/s Ratio Prot	0.19	0.00	c0.14	c0.35	c0.02	0.03
v/s Ratio Perm		0.05				0.02
v/c Ratio	0.29	0.08	0.77	0.40	0.37	0.17
Uniform Delay, d1	10.4	6.0	52.3	1.9	60.6	39.7
Progression Factor	1.32	1.38	1.11	0.86	1.00	1.00
Incremental Delay, d2	0.2	0.0	5.0	0.2	2.1	0.1
Delay (s)	13.9	8.2	63.1	1.8	62.7	39.8
Level of Service	B	A	E	A	E	D
Approach Delay (s)	13.3			15.1	44.3	
Approach LOS	B			B	D	

Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	150	370	241	50	18	53
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	402	262	54	20	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	316				1017	289
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316				1017	289
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				91	92
cM capacity (veh/h)	1244				229	750

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	402	316	77
Volume Left	163	0	0	20
Volume Right	0	0	54	58
cSH	1244	1700	1700	475
Volume to Capacity	0.13	0.24	0.19	0.16
Queue Length 95th (ft)	11	0	0	14
Control Delay (s)	8.3	0.0	0.0	14.0
Lane LOS	A			B
Approach Delay (s)	2.4		0.0	14.0
Approach LOS				B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	30	358	280	30	11	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	389	304	33	12	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	337				775	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	337				775	321
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				97	98
cM capacity (veh/h)	1222				357	720

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	33	389	337	24
Volume Left	33	0	0	12
Volume Right	0	0	33	12
cSH	1222	1700	1700	477
Volume to Capacity	0.03	0.23	0.20	0.05
Queue Length 95th (ft)	2	0	0	4
Control Delay (s)	8.0	0.0	0.0	12.9
Lane LOS	A			B
Approach Delay (s)	0.6		0.0	12.9
Approach LOS				B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1886	64	323	1045	151	753
v/c Ratio	0.64	0.05	0.48	0.26	0.69	0.76
Control Delay	16.2	0.1	44.4	4.9	71.7	43.2
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	0.1	44.4	4.9	71.7	43.2
Queue Length 50th (ft)	205	0	135	114	129	326
Queue Length 95th (ft)	m233	m0	180	176	195	367
Internal Link Dist (ft)	680			955	317	
Turn Bay Length (ft)			250			
Base Capacity (vph)	2932	1358	670	4094	420	988
Starvation Cap Reductn	301	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.05	0.48	0.26	0.36	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1735	59	297	961	139	693
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1886	64	323	1045	151	753
RTOR Reduction (vph)	0	19	0	0	0	6
Lane Group Flow (vph)	1886	45	323	1045	151	747
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	2	3	1	6	3	1
Permitted Phases		2				3
Actuated Green, G (s)	77.9	94.7	26.3	108.7	16.8	43.1
Effective Green, g (s)	77.9	94.7	26.3	108.7	16.8	43.1
Actuated g/C Ratio	0.58	0.70	0.19	0.81	0.12	0.32
Clearance Time (s)	5.2	4.4	4.4	5.1	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2934	1110	669	4094	220	981
v/s Ratio Prot	c0.37	0.01	0.09	0.21	0.09	c0.15
v/s Ratio Perm		0.02				0.12
v/c Ratio	0.64	0.04	0.48	0.26	0.69	0.76
Uniform Delay, d1	19.2	6.2	48.3	3.2	56.6	41.3
Progression Factor	0.77	0.00	0.87	1.36	1.00	1.00
Incremental Delay, d2	0.5	0.0	0.5	0.1	8.6	3.5
Delay (s)	15.3	0.0	42.7	4.5	65.2	44.9
Level of Service	B	A	D	A	E	D
Approach Delay (s)	14.8			13.5	48.3	
Approach LOS	B			B	D	

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	81	316	348	27	63	189
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	343	378	29	68	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		721				
pX, platoon unblocked						
vC, conflicting volume	408				912	393
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	408				912	393
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				76	69
cM capacity (veh/h)	1151				281	656

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	88	343	408	274
Volume Left	88	0	0	68
Volume Right	0	0	29	205
cSH	1151	1700	1700	492
Volume to Capacity	0.08	0.20	0.24	0.56
Queue Length 95th (ft)	6	0	0	84
Control Delay (s)	8.4	0.0	0.0	21.2
Lane LOS	A			C
Approach Delay (s)	1.7		0.0	21.2
Approach LOS				C

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	363	337	16	38	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	395	366	17	41	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1017				
pX, platoon unblocked						
vC, conflicting volume	384				804	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384				804	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	94
cM capacity (veh/h)	1175				347	671

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	17	395	384	83
Volume Left	17	0	0	41
Volume Right	0	0	17	41
cSH	1175	1700	1700	457
Volume to Capacity	0.01	0.23	0.23	0.18
Queue Length 95th (ft)	1	0	0	16
Control Delay (s)	8.1	0.0	0.0	14.6
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	14.6
Approach LOS				B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX L – 2

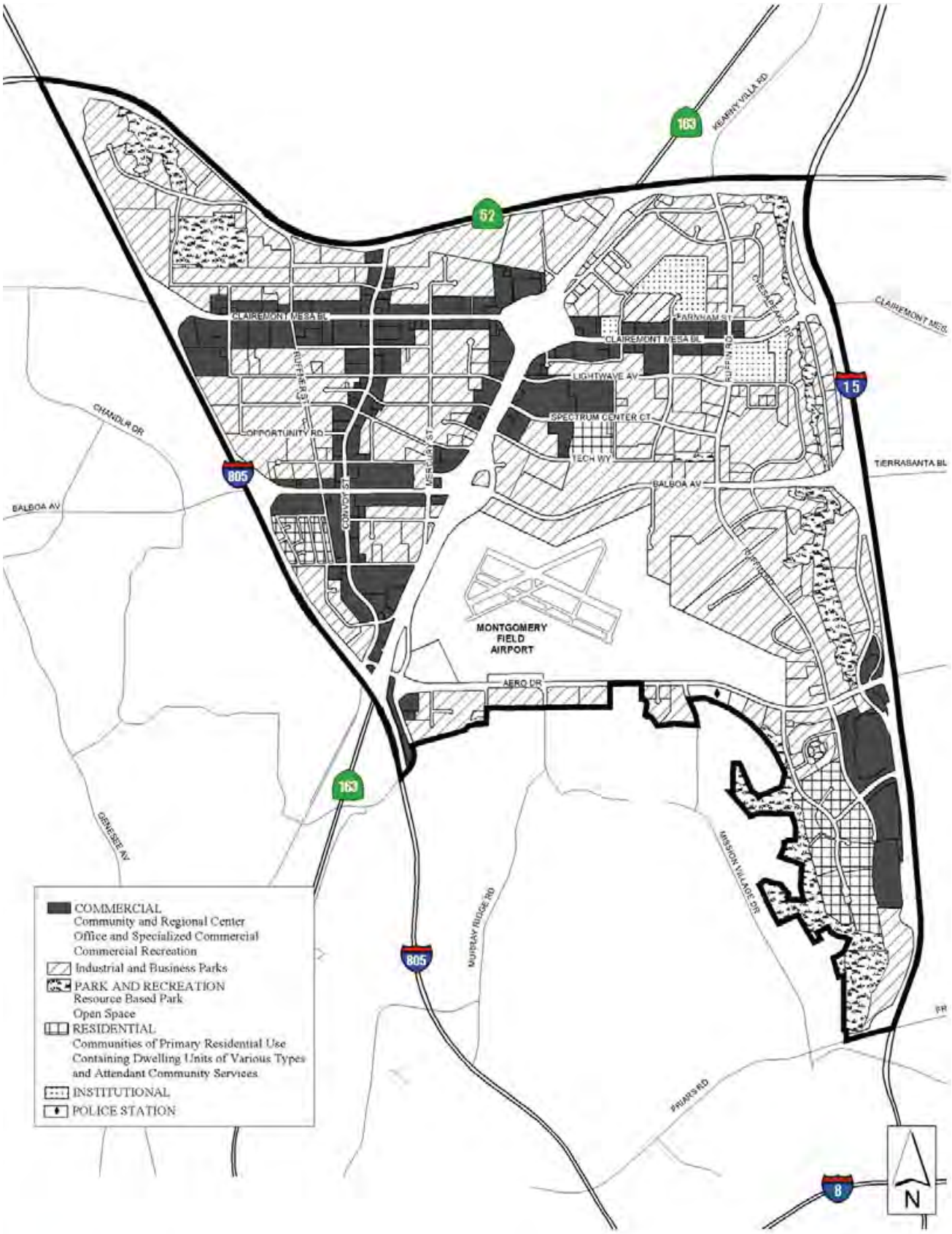
COMMUNITY PLAN LAND USE DESIGNATION - CURRENT AND PROPOSED

ZONE	PERMITTED USE
M-1A, M-1	INDUSTRIAL/RETAIL/OFFICE
M-1B, M-IP	INDUSTRIAL/OFFICE
CR	COMMERCIAL RECREATION
CO	COMMERCIAL OFFICE
CA,C-1	GENERAL COMMERCIAL
R-3000	MULTI-FAMILY RESIDENTIAL
R1-5000	SINGLE FAMILY RESIDENTIAL
R1-20000	LOW DENSITY RESIDENTIAL
R1-40000	VERY LOW DENSITY RESIDENTIAL
A-1-10	AGRICULTURE

Existing Zoning (1992)

Kearny Mesa Community Plan

6
FIGURE



Proposed General Plan Land Use Designations

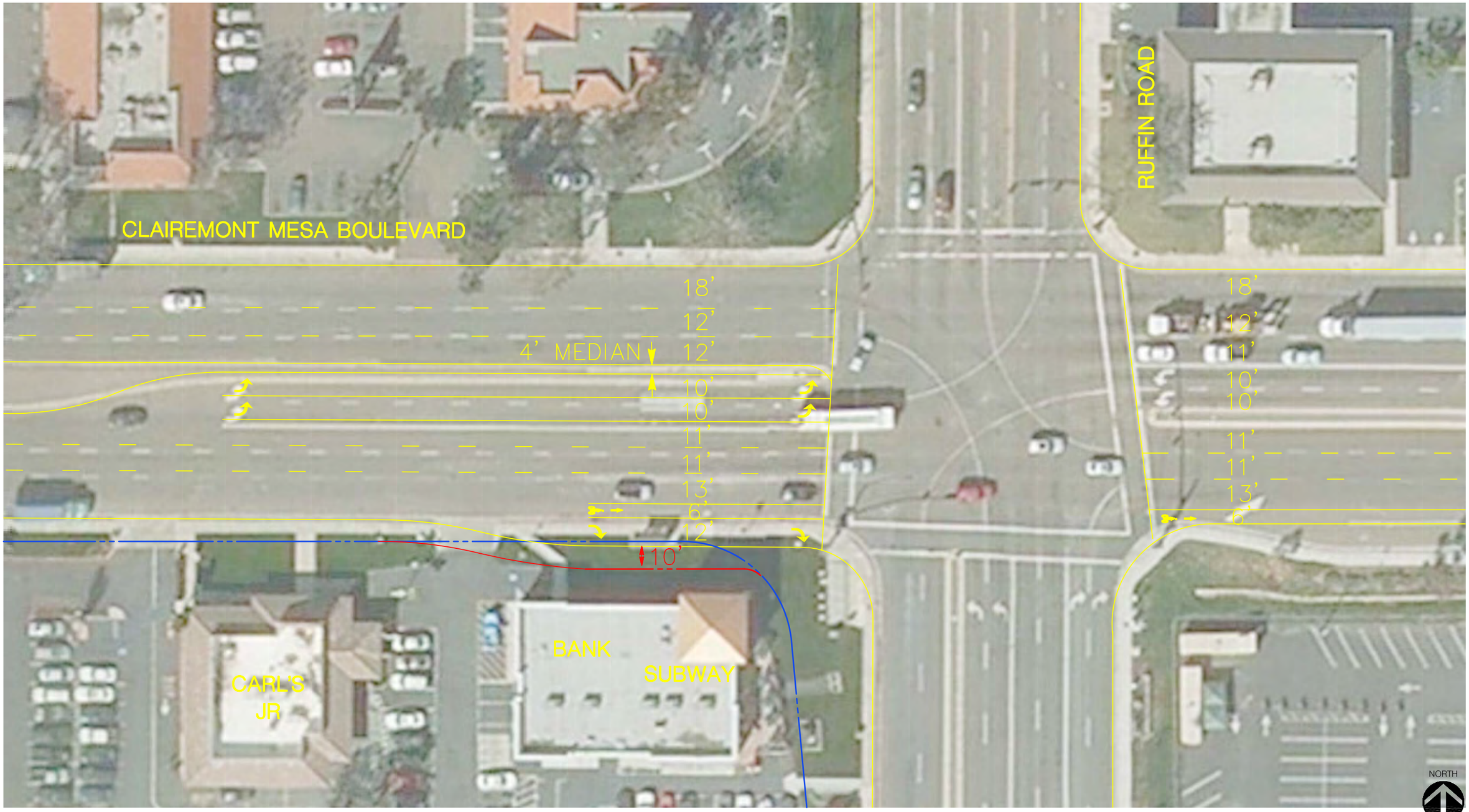
Kearny Mesa Community Plan

29
FIGURE

APPENDIX M

CONCEPTUAL SKETCHES OF RECOMMENDED IMPROVEMENTS AT:

FIGURE M-1: CLAIREMONT MESA BOULEVARD / RUFFIN ROAD INTERSECTION,
FIGURE M-2: CLAIREMONT MESA BOULEVARD: RUFFIN ROAD TO MURPHY CANYON ROAD, AND
FIGURE M-3: BALBOA AVENUE / RUFFIN ROAD INTERSECTION
FIGURE M-4: RAISED MEDIAN ON RUFFIN ROAD



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LINSCOTT LAW & GREENSPAN engineers

Existing Right-Of-Way
Additional Right-Of-Way

Figure M-1
Conceptual Plan: Clairemont Mesa Boulevard / Ruffin Road Intersection Improvements

SAN DIEGO CENTRAL HOSPITAL

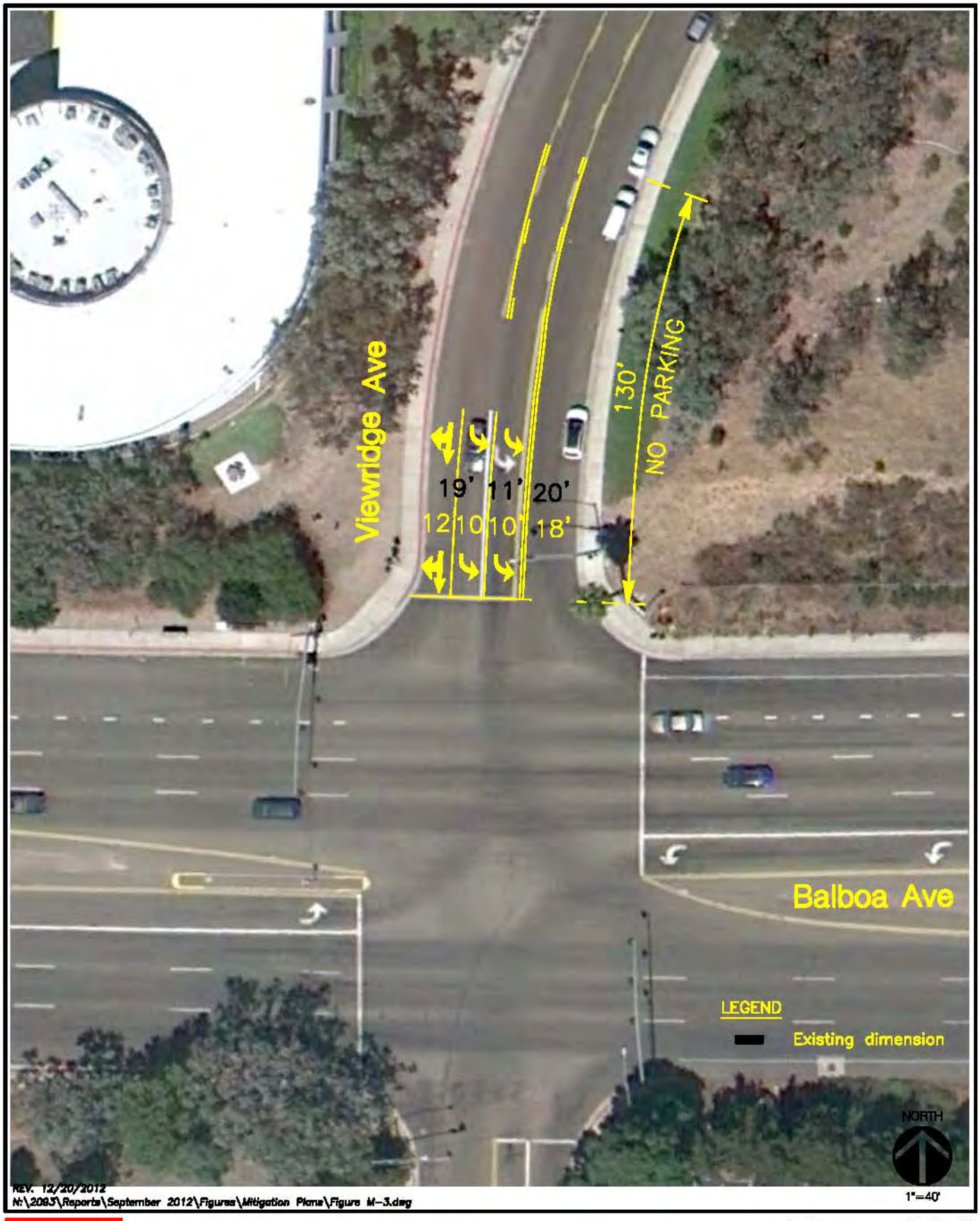
REV. 11/5/2012
N:\2093\Reports\September 2012\Figures\Mitigation Plans\Figure M-2_BW.dwg

LINSCOTT LAW & GREENSPAN engineers

Figure M-2

Conceptual Plan: Clairemont Mesa Boulevard Widening

SAN DIEGO CENTRAL HOSPITAL



LINSCOTT LAW & GREENSPAN engineers

Figure M-3
Conceptual Plan: Balboa Avenue / Viewridge Avenue Intersection Improvements

SAN DIEGO CENTRAL HOSPITAL

LINSCOTT
LAW &
GREENSPAN
engineers

Figure M-4
Conceptual Plan: Ruffin Road / Ruffin Court Median Improvement

SAN DIEGO CENTRAL HOSPITAL

APPENDIX N

PEAK HOUR INTERSECTIONS ANALYSIS WORKSHEETS WITH RECOMMENDED MITIGATION MEASURES

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Mitigated Near-Term PM (2030)
1/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	318	923	163	238	538	186	341	596	216	572	466	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2	5.2	4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	4890		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	4890		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	346	1003	177	259	585	202	371	648	235	622	507	316
RTOR Reduction (vph)	0	0	129	0	37	0	0	0	153	0	0	165
Lane Group Flow (vph)	346	1003	48	259	750	0	371	648	82	622	507	151
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	19.1	36.6	36.6	13.8	31.4		19.2	36.4	36.4	28.6	46.0	46.0
Effective Green, g (s)	19.1	36.6	36.6	13.8	31.4		19.2	36.4	36.4	28.6	46.0	46.0
Actuated g/C Ratio	0.14	0.27	0.27	0.10	0.23		0.14	0.27	0.27	0.21	0.34	0.34
Clearance Time (s)	4.4	5.2	5.2	4.4	5.1		4.4	5.6	5.6	4.4	5.4	5.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	486	1379	429	351	1137		488	954	427	727	1206	539
v/s Ratio Prot	c0.10	c0.20		0.08	0.15		0.11	c0.18		c0.18	0.14	
v/s Ratio Perm			0.03						0.05			0.10
v/c Ratio	0.71	0.73	0.11	0.74	0.66		0.76	0.68	0.19	0.86	0.42	0.28
Uniform Delay, d1	55.3	44.7	37.0	58.8	47.0		55.7	44.1	38.0	51.2	34.2	32.4
Progression Factor	0.80	1.31	4.54	0.92	1.08		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	2.7	0.4	7.8	3.0		6.9	3.9	1.0	9.7	1.1	1.3
Delay (s)	48.1	61.1	168.3	62.0	53.5		62.5	48.0	39.0	60.9	35.3	33.7
Level of Service	D	E	F	E	D		E	D	D	E	D	C
Approach Delay (s)		70.6			55.6			50.6			46.0	
Approach LOS		E			E			D			D	

Intersection Summary				
HCM Average Control Delay	56.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.4	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Mitigated Near-Term PM (2030)
1/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	918	167	109	503	330	430	522	361	698	654	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	4.4
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4968		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	998	182	118	547	359	467	567	392	759	711	257
RTOR Reduction (vph)	0	21	0	0	0	94	0	0	107	0	0	42
Lane Group Flow (vph)	163	1159	0	118	547	265	467	567	285	759	711	215
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases						6			8			4
Actuated Green, G (s)	7.7	30.8		9.3	32.6	51.0	18.8	29.4	29.4	18.4	29.1	36.8
Effective Green, g (s)	7.7	30.8		9.3	32.6	51.0	18.8	29.4	29.4	18.4	29.1	36.8
Actuated g/C Ratio	0.07	0.28		0.09	0.30	0.47	0.17	0.27	0.27	0.17	0.27	0.34
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	4.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	126	1412		152	1529	1311	595	960	429	583	950	537
v/s Ratio Prot	c0.09	c0.23		0.07	0.11	0.03	0.14	0.16		c0.22	c0.20	0.03
v/s Ratio Perm						0.06			0.18			0.11
v/c Ratio	1.29	0.82		0.78	0.36	0.20	0.78	0.59	0.66	1.30	0.75	0.40
Uniform Delay, d1	50.4	36.2		48.5	29.7	16.8	42.9	34.3	35.1	45.0	36.3	27.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	178.7	4.0		21.6	0.1	0.1	6.7	1.0	3.8	148.1	3.3	0.5
Delay (s)	229.0	40.2		70.1	29.8	16.9	49.6	35.3	39.0	193.1	39.6	27.9
Level of Service	F	D		E	C	B	D	D	D	F	D	C
Approach Delay (s)		63.1			29.9			41.0			105.3	
Approach LOS		E			C			D			F	

Intersection Summary				
HCM Average Control Delay	64.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	108.4	Sum of lost time (s)	20.4	
Intersection Capacity Utilization	78.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
7: Clairemont Mesa Boulevard & Ruffin Road

Mitigated 2035 + Proj PM
1/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	932	318	261	626	213	363	846	235	627	532	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	4.4
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	4891		3433	4891		3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	4891		3433	4891		3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	380	1013	346	284	680	232	395	920	255	682	578	348
RTOR Reduction (vph)	0	43	0	0	42	0	0	0	112	0	0	19
Lane Group Flow (vph)	380	1316	0	284	870	0	395	920	143	682	578	329
Turn Type	Prot			Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases									8			4
Actuated Green, G (s)	19.0	41.8		13.6	36.5		21.3	39.7	39.7	30.3	48.9	67.9
Effective Green, g (s)	19.0	41.8		13.6	36.5		21.3	39.7	39.7	30.3	48.9	67.9
Actuated g/C Ratio	0.13	0.29		0.09	0.25		0.15	0.27	0.27	0.21	0.34	0.47
Clearance Time (s)	4.4	5.2		4.4	5.1		4.4	5.6	5.6	4.4	5.4	4.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	450	1410		322	1231		504	969	433	717	1193	741
v/s Ratio Prot	c0.11	c0.27		0.08	0.18		0.12	c0.26		c0.20	0.16	0.06
v/s Ratio Perm									0.09			0.15
v/c Ratio	0.84	0.93		0.88	0.71		0.78	0.95	0.33	0.95	0.48	0.44
Uniform Delay, d1	61.6	50.2		64.9	49.4		59.6	51.7	42.0	56.6	38.1	25.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	12.6		23.4	3.4		7.8	19.0	2.0	22.3	1.4	0.4
Delay (s)	75.1	62.9		88.3	52.8		67.4	70.7	44.1	78.9	39.5	26.3
Level of Service	E	E		F	D		E	E	D	E	D	C
Approach Delay (s)		65.5			61.2			65.5			53.4	
Approach LOS		E			E			E			D	

Intersection Summary				
HCM Average Control Delay	61.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	14.4	
Intersection Capacity Utilization	90.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Clairemont Mesa Boulevard & Murphy Canyon Road

Mitigated 2035 + Proj PM
1/7/2013

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	0	1751	250	240	1049	200	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	1.00
Frt		1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)		5085	1583	1770	5085	1770	1583
Flt Permitted		1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)		5085	1583	1770	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1903	272	261	1140	217	565
RTOR Reduction (vph)	0	0	35	0	0	0	1
Lane Group Flow (vph)	0	1903	237	261	1140	217	564
Turn Type	Prot		Perm	Prot			pm+ov
Protected Phases	5	2		1	6	4	1
Permitted Phases			2				4
Actuated Green, G (s)		66.9	66.9	30.9	102.8	21.8	52.7
Effective Green, g (s)		66.9	66.9	30.9	102.8	21.8	52.7
Actuated g/C Ratio		0.50	0.50	0.23	0.76	0.16	0.39
Clearance Time (s)		5.7	5.7	4.4	5.1	5.3	4.4
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2520	784	405	3872	286	618
v/s Ratio Prot		c0.37		0.15	0.22	0.12	c0.21
v/s Ratio Perm			0.15				0.15
v/c Ratio		0.76	0.30	0.64	0.29	0.76	0.91
Uniform Delay, d1		27.4	20.2	47.1	4.9	54.1	39.0
Progression Factor		0.71	0.72	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6	0.7	3.5	0.2	11.0	17.9
Delay (s)		21.1	15.4	50.6	5.1	65.1	56.8
Level of Service		C	B	D	A	E	E
Approach Delay (s)		20.3			13.6	59.1	
Approach LOS		C			B	E	

Intersection Summary				
HCM Average Control Delay	25.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Balboa Avenue & Ruffin Road

Mitigated 2035 + Proj PM
1/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	970	180	120	790	352	520	593	390	770	705	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	4.4
Lane Util. Factor	1.00	0.91		1.00	0.91	0.88	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4966		1770	5085	2787	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4966		1770	5085	2787	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	235	1054	196	130	859	383	565	645	424	837	766	359
RTOR Reduction (vph)	0	18	0	0	0	55	0	0	131	0	0	7
Lane Group Flow (vph)	235	1232	0	130	859	328	565	645	293	837	766	352
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases						6			8			4
Actuated Green, G (s)	20.0	40.4		12.3	32.9	68.7	26.8	34.4	34.4	35.8	43.5	63.5
Effective Green, g (s)	20.0	40.4		12.3	32.9	68.7	26.8	34.4	34.4	35.8	43.5	63.5
Actuated g/C Ratio	0.14	0.28		0.09	0.23	0.48	0.19	0.24	0.24	0.25	0.30	0.44
Clearance Time (s)	4.4	6.3		4.4	6.1	4.4	4.4	5.4	5.4	4.4	5.3	4.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	247	1399		152	1167	1335	642	849	380	857	1074	701
v/s Ratio Prot	c0.13	c0.25		0.07	0.17	0.06	0.16	0.18		c0.24	0.22	0.07
v/s Ratio Perm						0.06			c0.18			0.15
v/c Ratio	0.95	0.88		0.86	0.74	0.25	0.88	0.76	0.77	0.98	0.71	0.50
Uniform Delay, d1	61.2	49.2		64.7	51.2	22.1	56.7	50.7	50.8	53.4	44.4	28.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	43.7	6.8		34.7	2.5	0.1	13.3	3.9	9.1	24.9	2.3	0.6
Delay (s)	105.0	56.0		99.4	53.7	22.2	70.1	54.6	59.9	78.2	46.7	29.2
Level of Service	F	E		F	D	C	E	D	E	E	D	C
Approach Delay (s)		63.8			49.2			61.3			56.9	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM Average Control Delay	58.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	143.4	Sum of lost time (s)	14.2
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Balboa Avenue & Viewridge Avenue

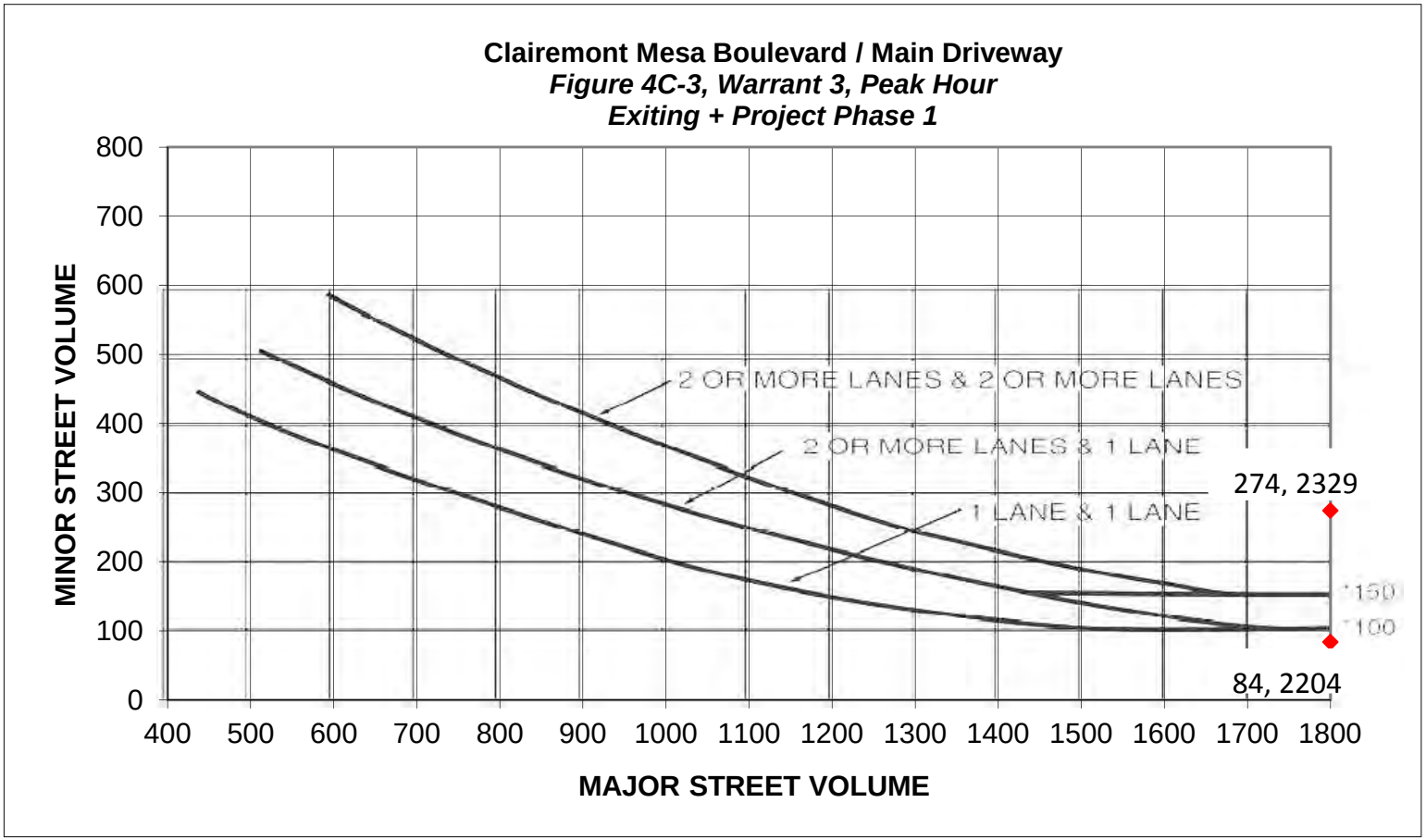
Mitigated 2035 + Proj PM
1/7/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	2020	40	50	862	254	50	20	600	541	40	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	7.1	7.1	4.4	6.1	6.1		4.9	4.9	4.9	4.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00		1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	6408	1583		1799	1583	3433	1612	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.51	1.00	0.71	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	6408	1583		951	1583	2557	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	2196	43	54	937	276	54	22	652	588	43	380
RTOR Reduction (vph)	0	0	15	0	0	151	0	0	42	0	79	0
Lane Group Flow (vph)	76	2196	28	54	937	125	0	76	610	588	344	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			4	
Permitted Phases			2			6	4		4	4		
Actuated Green, G (s)	5.5	64.4	64.4	3.2	63.1	63.1		55.1	55.1	55.1	55.1	
Effective Green, g (s)	5.5	64.4	64.4	3.2	63.1	63.1		55.1	55.1	55.1	55.1	
Actuated g/C Ratio	0.04	0.46	0.46	0.02	0.45	0.45		0.40	0.40	0.40	0.40	
Clearance Time (s)	4.4	7.1	7.1	4.4	6.1	6.1		4.9	4.9	4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	136	2354	733	79	2907	718		377	627	1013	639	
v/s Ratio Prot	c0.02	c0.43		0.02	0.15						0.21	
v/s Ratio Perm			0.02			0.08		0.08	c0.39	0.23		
v/c Ratio	0.56	0.93	0.04	0.68	0.32	0.17		0.20	0.97	0.58	0.54	
Uniform Delay, d1	65.6	35.3	20.4	67.4	24.3	22.5		27.6	41.3	32.9	32.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.9	7.6	0.0	21.7	0.1	0.1		0.3	29.1	0.9	0.9	
Delay (s)	70.5	42.9	20.4	89.1	24.4	22.7		27.8	70.4	33.8	33.1	
Level of Service	E	D	C	F	C	C		C	E	C	C	
Approach Delay (s)		43.3			26.8			66.0			33.5	
Approach LOS		D			C			E			C	

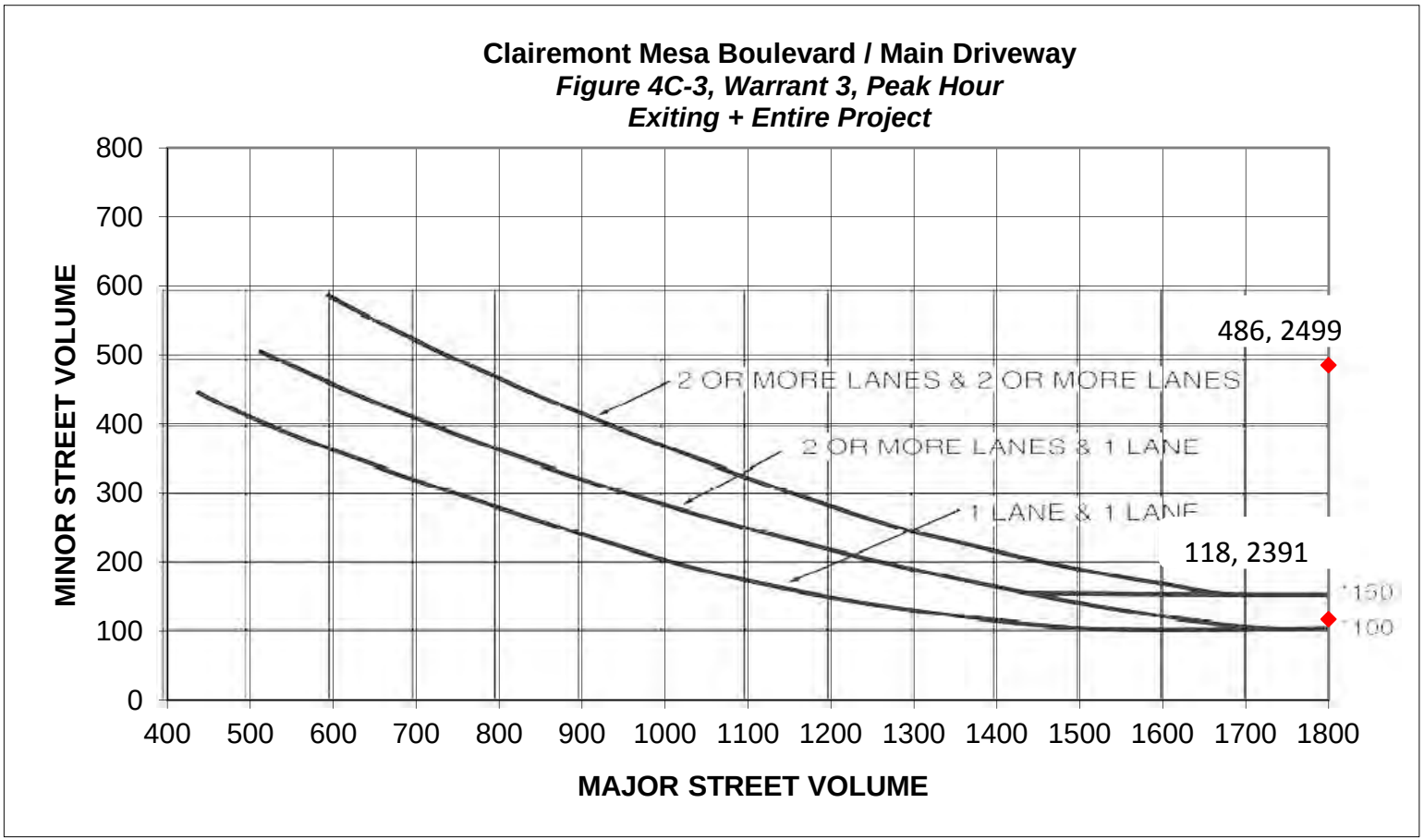
Intersection Summary			
HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	9.3
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX O

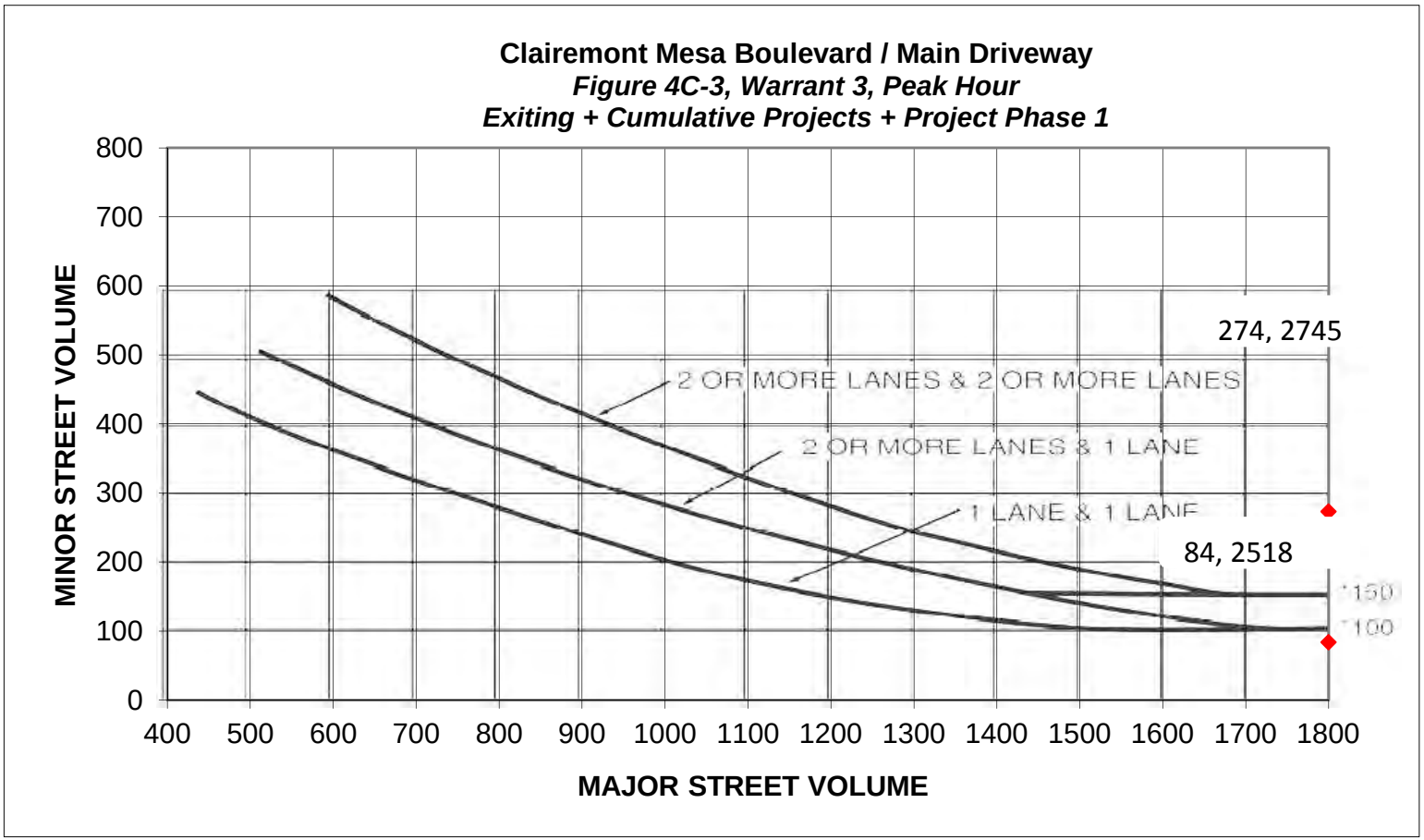
SIGNAL WARRANT ANALYSIS WORKSHEETS



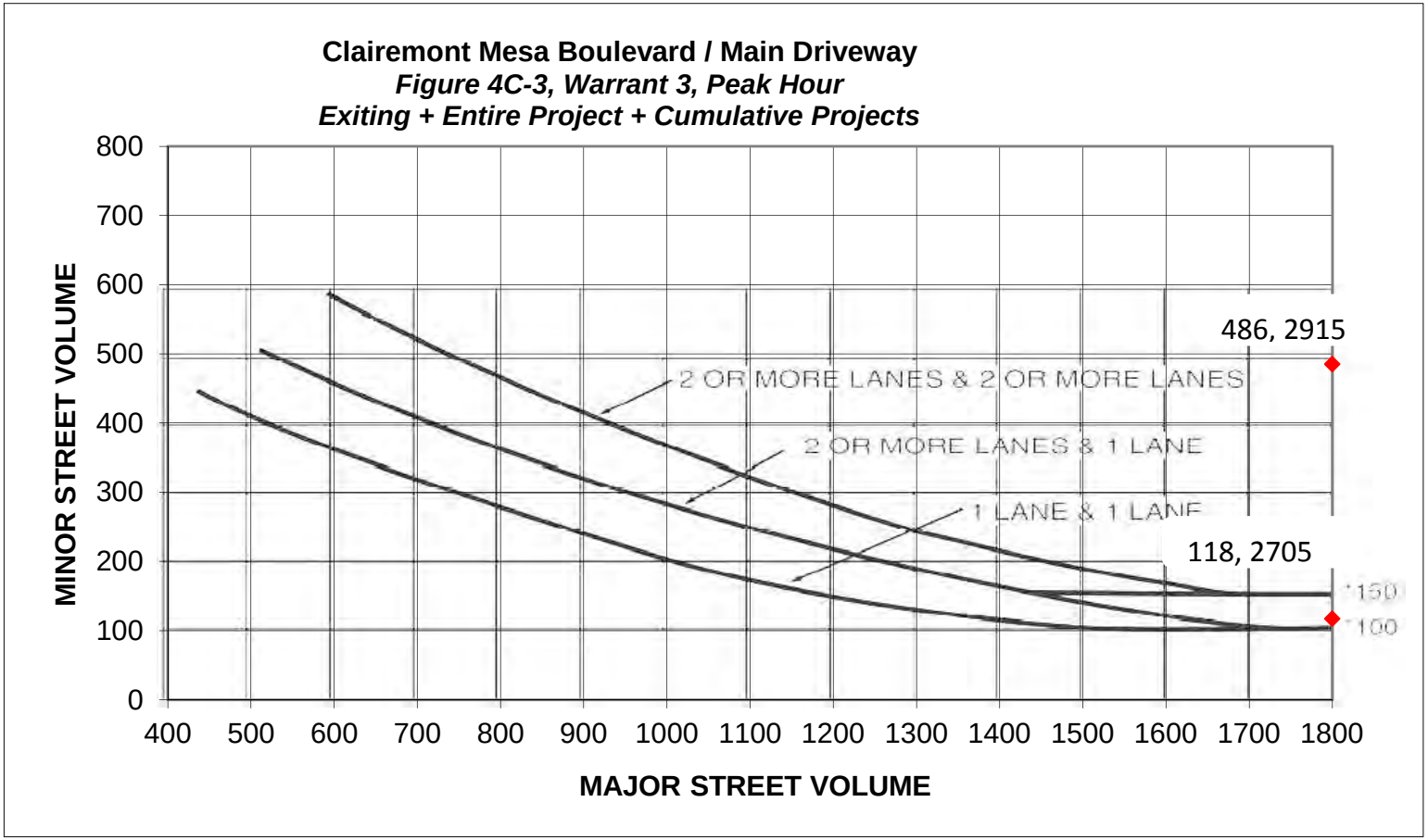
	AM	PM
Sum of Major:	2204	2329
Higher of Minor:	84	274
Peak Hour Warrant Met?	No	Yes



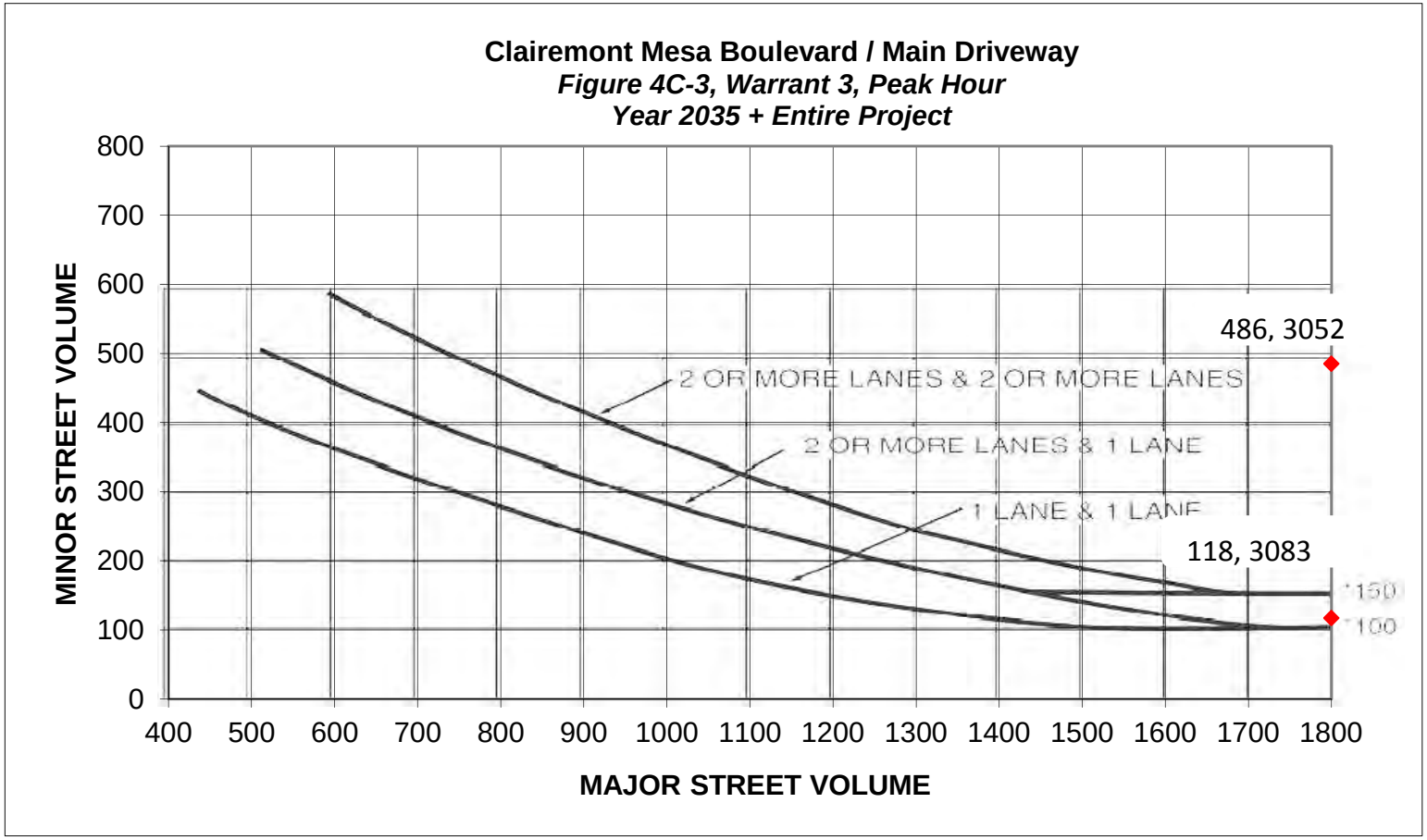
	AM	PM
Sum of Major:	2391	2499
Higher of Minor:	118	486
Peak Hour Warrant Met?	No	Yes



	AM	PM
Sum of Major:	2518	2745
Higher of Minor:	84	274
Peak Hour Warrant Met?	No	Yes



	AM	PM
Sum of Major:	2705	2915
Higher of Minor:	118	486
Peak Hour Warrant Met?	No	Yes



	AM	PM
Sum of Major:	3083	3052
Higher of Minor:	118	486
Peak Hour Warrant Met?	No	Yes

MEMORANDUM

To:	Mr. Skyler Denniston, Kaiser Permanente & Shawn Shamlou, DUDEK	Date:	June 6. 2013
From:	John Boarman P. E. & Narasimha Prasad LLG, Engineers	LLG Ref:	3-11-2093
Subject:	Kaiser San Diego Central Medical Center - Project Alternatives Traffic Assessment		

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LLG conducted a traffic analysis of the project alternatives for the above referenced project. Two alternatives were identified. Following are brief descriptions of each and an assessment of the traffic operations.

ALTERNATIVE 1 - OFF-SITE LOCATION

Description - There are few if any similarly sized sites under single ownership in the project area. Kaiser could foreseeably assemble, lease, or purchase land for certain components of the proposed project, such as medical office space, in nearby office parks such as the Spectrum Sunroad development between Overland Avenue and Kearny Villa Road. The hospital would still be built at the proposed project site. Additionally, Kaiser could redevelop its existing facilities at 7060 Clairemont Mesa Blvd and 5871 Copley Drive, both of which are near I-805.

Transportation/Traffic Circulation - If in this alternative the entire hospital was not located on a single site, it would then generate more traffic trips overall than the proposed project since doctors would be forced to travel back and forth between the medical offices and main hospital campus. The synergy between the hospital and the medical offices would be lost. Therefore, this alternative would result in greater traffic impacts when compared to the proposed campus-oriented project and additional traffic to more intersections and segments, depending on where each of the hospital facilities would be located. The applicant may not be able to reasonably acquire, control, or otherwise have access to other sites in the area that would meet the project objectives. Therefore, off-site locations capable of accommodating the entire project are considered infeasible.

ALTERNATIVE 2 – REDUCED BED ALTERNATIVE

Description - This alternative assumes a reduced number of beds, with the goal of avoiding or substantially reducing one or more of the project's identified significant impacts, particularly air quality. To reduce PM10 and carbon monoxide emissions to below a level of significance, it was calculated that a 35.4% reduction in the net daily vehicle trips to and from the project would be required. This equates to 223 fewer

beds, for a total of 227 beds. Other project components on the site for this alternative would not change from the project.

Transportation/Traffic Circulation - With a reduction to 227 beds, this alternative would generate less daily traffic (ADT) than the Proposed project. However, it would still result in additional trips along the roadways in the project vicinity.

Trip Generation - Table A summarizes the trip generation with the reduced bed Alternative. As seen in Table A, the project is calculated to generate 3,808 daily trips with 96 AM peak hour trips and 361 PM peak hour trips.

Intersection Operations - Table B summarizes the Near-Term peak hour operations at intersections where direct impacts were determined by the proposed project. As seen in Table B, even with the reduced number of beds, direct impacts are calculated at the two intersections where the proposed project was determined to have direct impacts. Therefore, no direct significant intersection impacts will be eliminated with the reduced bed alternative.

Table C summarizes the Year 2035 peak hour operations at intersections where significant cumulative impacts were determined by the proposed project. As seen in Table C, with the reduced number of beds, cumulative impacts are calculated at two of the four intersections where the proposed project was determined to have cumulative impacts. At the remaining two intersections where the project continues to have a significant cumulative impact, the delays are lower.

The two intersections where the reduced project is calculated to have significant cumulative impacts are Clairemont Mesa Blvd / Ruffin Road and Ruffin Road / Balboa Avenue. Therefore, the reduced bed alternative will eliminate two of the four long-term significant cumulative impacts.

Freeway Operations - Table D summarizes the freeway operations. As seen in Table D, with the reduced project, the project will continue to have a significant cumulative impact in the Year 2035 in the southbound direction from Clairemont Mesa Boulevard to Balboa Avenue and from Balboa Avenue to Aero Drive, but the increase in the v/c ration due to the project will be lesser than due to the proposed project.

Metered Ramp Operations - Table E summarizes the metered ramp operations. As seen in Table E, with the reduced project, the project will continue to have a significant cumulative impact in the Year 2035 at the Clairemont Mesa Boulevard on-

LINSCOTT LAW & GREENSPAN engineers

ramp to southbound I-15, but the reduced bed alternative will result in lesser delay and queue length than due to the proposed project.

As seen in the preceding paragraphs, even with reduction in trips the project would still continue to have near-term significant direct and long-term significant cumulative impacts as follows:

Near-Term Impacts (lesser delays)

1. Clairemont Mesa Boulevard / Ruffin Road intersection
2. Ruffin Road / Balboa Avenue intersection

Freeway Segments (lower increase in v/c ratios)

3. I-15: Clairemont Mesa Boulevard to Balboa Avenue
4. I-15: Balboa Avenue to Aero Drive

Metered On-Ramp (lesser delays and queues)

5. Clairemont Mesa Boulevard on-ramp to southbound I-15.

Hence, similar to the Proposed Project, with the reduced bed alternative direct impacts would be potentially significant and unmitigated but with lower delays, and cumulative impacts would remain significant and unmitigated, with lower delays (intersections), v/c ratios (freeway segments) or queue lengths (metered ramps).

Please call at (858) 300-8800, if you have any questions.

cc: Ms. Ann Gonsalves, P. E., City of San Diego
Mr. Shawn Shamlou, DUDEK
File

Table A

Alternative 2 Trip Generation

Land Use	Quantity	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
				% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume[b]		
		Rate [a]	Volume			In	Out	Total			In	Out	Total
Hospital	227 Beds	20 /Bed	4,540	9%	70 : 30	286	123	409	10%	30 : 70	136	318	454
Medical Offices													
Driveway Trips	180 KSF	50 /KSF	9,000	6%	80 : 20	432	108	540	10%	30 : 70	270	630	900
With Passby / Diverted Trips [c]	180 KSF	20 /KSF	3,600	6%	80 : 20	173	43	216	10%	30 : 70	108	252	360
Subtotal Driveway Trips			**13,540**			**718**	**231**	**949**			**406**	**948**	**1,354**
With Passby / Diverted Trips (New Trips) [c]			**8,140**			**459**	**166**	**625**			**244**	**570**	**814**
(Less) Existing Site Trip Generation (June 2011)			(4,332)			(452)	(77)	(529)			(82)	(371)	(453)
Increase in Net Trips			**3,808**			**7**	**89**	**96**			**162**	**199**	**361**

Footnotes:

a. Trip rates from *Trip Generation Manual* , City of San Diego, May 2003.

b. KSF - 1,000 Square Feet.

c. Daily cumulative trip rate is 20 per KSF for MOB of less than 100 KSF and 16 per KSF for MOB of 100 KSF or more.

c. City of San Diego terms trip rates with Pass-by / diverted trips as "Cumulative Trips".

Table B
Near-Term Intersection Operations

Intersection	Proposed Project								Alternate 2			
	Control Type	Peak Hour	Near-Term without Project		Near-Term + Entire Project		Δ [c] Delay	Impact Type	Near-Term + Entire Project		Δ [c] Delay	Impact Type
			Delay[a]	LOS[b]	Delay	LOS			Delay	LOS		
7. Clairemont Mesa Blvd / Ruffin Rd	Signal	PM	57.0	E	**59.6**	**E**	**2.6**	**Direct**	**59.1**	**E**	**2.1**	**Direct**
22. Ruffin Rd / Balboa Ave	Signal	PM	68.1	E	**73.7**	**E**	**5.6**	**Direct**	**71.4**	**E**	**3.3**	**Direct**

Table C
Year 2035 Intersection Operations

Intersection	Proposed Project								Alternate 2			
	Control Type	Peak Hour	Year 2035 Without		Year 2035 + Entire Project		Δ Delay	Impact Type	Year 2035 + Entire Project		Δ [c] Delay	Impact Type
			Delay	LOS	Delay	LOS			Delay	LOS		
7. Clairemont Mesa Blvd / Ruffin Rd	Signal	PM	61.6	E	**65.1**	**E**	**2.6**	**Cumulative**	**63.7**	**E**	**2.1**	**Cumulative**
9. Clairemont Mesa Blvd / Murphy Canyon Rd	Signal	PM	46.8	D	**58.4**	**E**	**5.6**	**Cumulative**	49.7	D	2.9	None
22. Ruffin Rd / Balboa Ave	Signal	PM	60.8	E	**66.4**	**E**	**5.6**	**Cumulative**	**65.3**	**E**	**4.5**	**Cumulative**
23. Viewridge Ave / Balboa Ave	Signal	PM	52.8	D	**57.9**	**E**	**6.6**	**Cumulative**	53.6	D	0.8	None

Table D
Year 2035 With Project

Freeway Segment	Dir.	# of Lanes	Hourly Capacity [a]	Year 2035 No Project Peak Hour Volume [e]		Project Traffic		Year 2035 With Project Peak Hour Volume [e]		V/C [f]		LOS		Δ V/C	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Interstate 15															
Clairemont Mesa Boulevard to Balboa Avenue	NB	4 + 1	9,200	8,369	8,055	3	73	8,372	8,128	0.910	0.883	D	D	0.000	0.008
	SB	4 + 1	9,200	9,306	9,164	40	90	9,346	9,254	1.016	**1.006**	**F(0)**	**F(0)**	0.004	**0.010**
Balboa Avenue to Aero Drive	NB	4 + 1	9,200	8,893	8,559	4	92	8,897	8,651	0.967	0.940	E	E	0.000	0.010
	SB	4 + 1	9,200	9,889	9,737	51	114	9,940	9,851	**1.080**	**1.071**	**F(0)**	**F(0)**	**0.006**	**0.012**

Footnotes:

a. The number of lanes shown indicates the number of mainline lanes + the number of Auxiliary lanes. No HOV lanes are currently provided on the above freeway segments of I-15, SR 52 or SR
b. Capacity calculated at 2000 vph per lane and 1200 vph per Auxiliary lane.
c. Existing ADT Volumes from CALTRANS
d. Peak Hour Percentage (K) and Direction Split (D) from CALTRANS, 2009
e. Truck Factor from "2010 Annual Average Daily Truck Traffic on the California State Highway System".
f. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
g. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

General Notes:
Bold indicates a significant impact

LOS	v/c
A	<0.41
B	0.62
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

Table E
Ramp Meter Analysis - Long-Term

Year 2035

Location/Condition	Peak Hour	Peak Hour Flow (F) (veh/hr/ln)	Calculated (Most Restrictive)				Observed (Proportionate)	
			Discharge Rate (veh/hr/ln)	Excess Demand E (veh/hr/ln)	Delay (min/ln)	Queue	Delay	Queue
EB Clairemont Mesa Boulevard to SB I-15			15% Reduction to volumes in SOV lanes due to HOV lane				2 SOV+1 HOV	
Year 2035 No Project - SOV	PM	507	312	195	38	4883	25	299
Year 2035 No Project - HOV	PM	125	312	0	0	0	0	0
Year 2035 With Project - SOV	PM	547	312	235	45	5884	30	360
Year 2035 With Project - HOV	PM	135	312	0	0	0	0	0